

Appendix A:

45-Day Comment Letters

Comments received during the 45-day comment period of the original proposal,

June 3, 2016 – July 18, 2016

Mark A. Smith
5508 Via Ravenna
Bakersfield, California 93312
June 23, 2016

Clerk of the Board
Air Resources Board
1001 I Street,
Sacramento, California 95814

Subject: Proposed Greenhouse Gas Regulations

Dear Sir or Madam:

I have reviewed the new version of the regulations. There are real improvements that focus the regulations upon the most significant sources of greenhouse gasses. I appreciate the thought and discussions that must have gone into the revisions.

In two places, there are limits that would apply to many small operators. In each case, the regulation cites no method by which your agency or a facility operator could demonstrate that the facility and component are within the acceptable range.

OP-1-1

Each of these regulations concerns oil production. Operators are required to submit monthly reports to the Department of Conservation Division of Oil, Gas and Geothermal Resources. These reports include the volume and API Gravity of oil and the volume of produced water. The data is certified by the operator upon submission and is an accurate source to demonstrate compliance with the proposed regulations. I therefore suggest the following changes to the regulations:

1. Section 95668 cites exceptions to the requirements. In order to be able to demonstrate compliance, I suggest section (a)(2) be modified with the additional language shown in bold type.

“(a)(2) The requirements of section 95668(a) do not apply to the following:

(A) Separator and tank systems that receive less than 50 barrels of crude oil per day and that receive less than 200 barrels of produced water per day. ***The volume of crude oil and produced water as reported to the Department of Conservation Division of Oil, Gas and Geothermal Resources shall be used to demonstrate compliance and shall be subject to review every calendar year.***”

OP-1-2

2. Section 95669 also cites instances in which the requirements would not apply. For this section it is important to note that the gravity of produced oil is not fixed but varies somewhat. For our operations, the average API Gravity is about 19.5, but from time to time a shipment has an API Gravity slightly above 20. Since at an average of less than 20 gravity the operation would meet the intent of the rules, it seems reasonable that this variation should not trigger application of the requirements. I suggest that the average API Gravity be used to judge whether the standard has been met, as follows:

“(b) The requirements of this section do not apply to the following...

(2) Components, including components found on tanks, separators, and pressure vessels used exclusively for crude oil with an **average** API Gravity less than 20. ***The average of annual crude oil API Gravity as reported to the Department of Conservation Division of Oil, Gas and Geothermal Resources shall be used to demonstrate compliance and shall be subject to review every calendar year.***”

OP-1-3

Thank you for the opportunity to comment.

Sincerely,



Mark A. Smith

xc: Joe Fischer, Project Lead
Oil & Gas Regulation
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812



OIL AND GAS MEASUREMENT AND ANALYSIS

8850 Interchange Drive
Houston, TX 77054
Office: 713-660-0901
Fax: 713-660-8975

**SPL Response to CARB Proposed Rule and the Proposed Appendix C
“Test Procedure for Determining Annual Flash Emission Rate of Methane from Crude Oil, Condensate
and Produced Water”**

My name is Joe Landes, and I am the Executive Vice-President of Technical Services for SPL, Inc. I am currently the Chairman of GPA Technical Section B, “Analysis”, as well as a member of ASTM committees and the API Committee on Liquid Measurement.

SPL, formerly known as Southern Petroleum Laboratories, has been in business for over 70 years, providing measurement and analytical services to the upstream, midstream and downstream sectors of the oil and gas industry. We have extensive experience in hydrocarbon and environmental testing, analyzing thousands of samples each month, many of which are pressurized crude oil, condensate and produced water.

SPL is working on an on-going study to evaluate sampling and analytical methods for pressurized hydrocarbon liquids, and, based on our years of experience as well as study data and findings to date, we have the following suggestions and recommendations regarding the proposed test procedure.

Section 3

3.5

The double valve (i.e., constant volume (CV)) cylinder is not viable for sampling produced water, since the displacement fluid is normally either water or glycol. We only use Piston (i.e., constant pressure (CP)) Cylinders for sampling produced water. In the study that we are participating in, double valve cylinders are being utilized in simultaneous sampling events of pressurized condensate with Piston Cylinders. The data does not indicate significant differences in analytical results for CV and CP cylinder samples.

OP-2-1

3.9

To avoid confusing the gas-to-oil ratio used by producers to quantify the ratio of gas production to oil production from a well, “GOR” should be named FGOR (i.e., flash gas-to-oil ratio) and should be expressed in “Standard Cubic Feet per Storage Tank Barrel”.

OP-2-2

$$FGOR = \frac{\text{Volume of Flash Gas (scf)}}{\text{Volume of Post-flash Oil (bbl)}}$$

Many producers do not have meters on the separator (or if they do it is likely they are not reliable) and will report oil production volume based on the post-flash oil in the storage tank. If you do not make this correction, the FGOR and reported emissions will likely be low.

3.10

FGWR should be expressed in “Standard Cubic Feet per Storage Tank Barrel”.

OP-2-3

$$FGWR = \frac{\text{Volume of Flash Gas (scf)}}{\text{Volume of Post-flash Water (bbl)}}$$

OP-2-3
continued

If you do not make this correction, the reported FGWR and reported emissions will likely be low.

3.16

If the separator to tank liquid flows continuously, the operators would not be allowed to use snap-acting dump valves (which is typical operating practice), and could only use throttle dumps. We believe that the use of the term “Steady State conditions” is misleading. In our study, (the results of this work will be published) we are seeing data that indicates that this statement is incorrect (i.e., separators are dynamic systems and the operating pressure will vary with the pressures of adjacent processes and equipment such as sales gas pipeline pressure).

OP-2-4

3.16 - 3.21

A general comment regarding the various definitions for separators, pressure separators, tanks, separator and tank system, etc. is that it should be clear to the tester that the pressurized sample should be collected from the separator that is immediately upstream of any storage tank that has the potential to vent gas to the atmosphere. Some production sites have multiple stages of separation in series before the storage tanks, and the sample should be collected from the last separator prior to flashing at the storage tank.

OP-2-5

Section 4

4.5

Pressure gauges and thermometers should be recertified annually as a best practice and verified more frequently.

OP-2-6

Section 5

5.1 And 5.2

It is also our recommendation that the accuracy of the pressure gauge is $\pm 0.1\%$.

5.3

It is our recommendation that the accuracy of the thermometer is $\pm 0.5^\circ\text{F}$.

Section 8

8.1

See comment in 3.5. Does data exist to substantiate the statement “The double valve cylinder sampling method is ... not applicable for collecting samples of condensate”? Our data conflicts with this statement and does not indicate significant differences in analytical results for condensate samples collected simultaneously in Double Valve and Piston cylinders.

OP-2-7

Figure 1

There should be a valve on the sample probe before the thermometer and pressure gauge.

OP-2-8

8.10

This section states that the recommended rate of filling the pressurized liquid sample container is 150 - 200 milliliters per minute (3 drips per second). SPL's comment is that this sample rate is too rapid and is likely to cause flashing in the sample cylinder. The goal is to not flash the sample. SPL typically recommends that you displace the water at a rate as low as 20 milliliters per minute (ml/min.), and preliminary data indicate that sample rates greater than 60 ml/min may compromise a pressurized condensate sample. The method should also state that the fill rate should be determined by the line pressure and that care should be taken not to flash the sample.

OP-2-9

This section states that the sample container should be filled to 80-95%. It is SPL's experience that you should fill to 80% and take outage of about 10% to accommodate for thermal expansion. Depending on the amount of light hydrocarbons in the liquid sample, you could get an increase in sample pressure of 30-50 psi per degree of temperature increase. For instance, if your sampling pressure is 300 psi, thermal expansion is 50 psi per degree, and you have a 30 degree rise in temperature, you would likely blow the sample cylinder pressure relief valve (rated at 1800 -10%, or 1620 psi).

OP-2-10

Samples with outage are re-pressurized in the laboratory to at least 200 psi above sampling pressure, and we have data in our study that indicates that this does not cause sample distortion.

Note: DOT states in 49 CFR 173.40 regarding outage requirements, "Sufficient outage must be provided so that the cylinder will not be liquid full at 55°C (131°F)."

8.11

See comment on **3.16** and delete the words "Steady State".

OP-2-11

8.16

The reference to **Section 12** should be to **Section 10**.

Section 9

9.1

Sampling at 15 psig may not be possible without using a syringe-type cylinder or a pump. Typically, a piston cylinder requires between 30-40 psid for the piston to move properly.

OP-2-12

Figure 3

There should be a valve on the sample probe before the thermometer and pressure gauge.

9.7

This section states that the recommended rate of filling the pressurized liquid sample container is 150 - 200 milliliters per minute. SPL's comment is that this sample rate is too rapid and is likely to cause flashing in the sample cylinder. The goal is to not flash the sample. SPL typically recommends that you displace the water at a rate as low as 20 milliliters per minute (ml/min.), and preliminary data indicate that sample rates greater than 60 ml/min may compromise a

Repeat of
OP-2-9

pressurized condensate sample. The method should also state that the fill rate should be determined by the line pressure (higher line pressures require slower fill rates) and that care should be taken not to flash the sample.

Repeat of
OP-2-9
continued

This section states that the sample container should be filled to 80-95%. It is SPL's experience and manufacturer's recommendations that you should fill to not more than 80% to accommodate for thermal expansion. Depending on the amount of light hydrocarbons in the liquid sample you could get an increase in sample pressure of 30-50 psi per degree of temperature increase. For instance, if your sampling pressure is 300 psi, thermal expansion is 50 psi per degree, and you have a 30 degree rise in temperature, you would likely blow the pressure relief valve (rated at 1800 -10%, or 1620 psi). The sample is re-pressurized in the laboratory to at least 200 psi above sampling pressure, and we have data in our study that indicates that this does not cause sample distortion.

Repeat of
OP-2-10

9.13

The reference to **Section 12** should be to **Section 10**.

Repeat of
OP-2-11

Section 10

This draft would benefit the readers if it was re-written to reduce ambiguity. We recommend GPA 2103 for analysis of pressurized oil or condensate samples, since it is an industry recognized reference method for this type of analysis. GPA 2186 is an appropriate analytical method for lighter NGL samples, and method modifications to eliminate normalization can improve analytical results for heavier condensate and oil samples. There is not a reference (e.g., GPA, ASTM, or EPA) method for flash liberation, and flash liberation is typically documented as an SOP for an individual lab; thus, flash liberation methods and practices can vary widely depending on the lab. It would be expected that the variations in results from flash liberation analyses could make it difficult to demonstrate a consistent estimation of emission rate as described in Subchapter 10, Article 3, Section 95213 (C). We have data from our study that will be published where these methods are compared.

OP-2-13

10.1 (c)

Operational performance checks to evaluate and validate pressurized hydrocarbon sampling and analysis results are not listed in the document. At a minimum, we would suggest a comparison of Bubble Point Pressure (at sample collection temperature) to Separator Pressure. We are currently working on a study that will soon be published and we are evaluating several means to validate pressurized hydrocarbon liquid sample analyses.

OP-2-14

10.2 (d) and 10.3 (a)

Heating liquid samples can pose a safety risk, related to the comments on **Section 8.10** and **9.7**.

OP-2-15

10.2 (g)

GPA 2174 is a sampling document. GPA 2261 and GPA 2177 are analytical procedures. None of the dates listed are current, GPA 2174-14, GPA 2261-13 and GPA 2177-13 are the most recent revisions to those standards.

OP-2-16

10.3 (a)

Heating liquid samples can pose a safety risk, related to the comments on **Section 8.8** and **9.7**.

OP-2-17

10.4 (a)

Equation 4 should read as follows:

$$Volume_{Vapor Std} = Volume_{Vapor Lab} \times \frac{459.67 + 60^{\circ} F}{459.67 + T_{Lab}^{\circ} F} \times \frac{P_{Lab} psia}{14.696 psia}$$

10.4 (b)

Equation 5 should read as follows:

$$Volume_{Liquid Std} = \frac{Mass_{Liquid Lab}}{Density_{60^{\circ} F} \times 42 \times 3785.412}$$

10.4 (c)

Equation 6 should read as follows:

$$FGOR = \frac{Volume\ of\ Flash\ Gas\ (scf)}{Volume\ of\ Post-flash\ Oil\ (bbl)}$$

Or

$$FGWR = \frac{Volume\ of\ Flash\ Gas\ (scf)}{Volume\ of\ Post-flash\ Water\ (bbl)}$$

OP-2-18

10.4 (c) Note:

See comments in **3.5** and **8.1**.

Repeat of

OP-2-1 &

OP-2-7

10.5 (a)

GPA 2286-14, ASTM D-1945-14 are the most current versions of these standards. ASTM D-1945 is the technical equivalent of GPA 2261. Either of these can be used as the "TCD" portion of GPA 2286, which is an extended analysis method.

ASTM D3588-98 is a document used for calculation of properties of gaseous mixtures, similar to GPA 2172-09, which is more recent. Regardless of which calculation routine is used, it is necessary to reference GPA 2145-09 (GPA 2145-16 will likely be available by the release of this document and should be referenced when it becomes available. For that matter, all reference methods should reference the most current revision.)

OP-2-19

"ASTM D-2597 is being balloted for withdrawal. Gas Processors Association (GPA) recently completed a significant study to update the GPA equivalent method, GPA 2177, and update the precision. Rather than spend considerable time to totally revise D2597 to align with GPA 2177, and since D2597 is not quoted in any ASTM product specifications, Subcommittee H leadership recommends that D2597 be withdrawn, with the withdrawal notice directing people to GPA 2177, a more up-to-date test method for the determination of the same components." – copied from ASTM website.

Section 11

11.1

It should be clarified that the FGOR and FGWR be calculated per “Storage Tank Barrel” and not per “Separator Barrel” and that the calculations use the correct measurement so that emission calculations are correct. **Equation 1** should read as follows:

$$Volume_{Gas} = FGOR \times Volume_{Post-flash\ liquid, Bbl/day} \times 365$$

11.2 And 11.3

The equations should be formatted properly.

Section 12

Table 1 appears to be incomplete.

Section 13

The prescribed analysis method you list, “Flash Liberation” is not an ASTM or GPA method. It may contain steps that are modifications of ASTM or GPA methods, but there is no reference method for flash liberation. We are working on a related project, and the results of GPA 2186 (modified to eliminate normalization) and GPA 2103 are at least the equivalent of, if not superior to flash liberation. We have data from multiple laboratories running all three methods on multiple Certified Reference Materials that is soon to be published.

All references to industry standards should reflect the most recent revision.

OP-2-20

OP-2-21

OP-2-22



Comment Log Display

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.

COMMENT 3 FOR CRUDE OIL AND NATURAL GAS FACILITIES REGULATION (OILANDGAS2016) - 45 DAY.

First Name: Heather

Last Name: Shelby

Email Address: hshelby@edf.org

Phone Number:

Affiliation: Environmental Defense Fund

Subject: 3,974 comments in support of strong methane regulations

Comment:

To Whom It May Concerned:

Attached, please find the signatures of 3,974 EDF Activists from across California who have submitted electronic comments in favor of your proposed regulation for greenhouse gas emission standards for crude oil and naturalgas facilities.

The comment they each submitted reads:

"I'm writing today to support your proposed rules limiting methane pollution from California's oil and gas industry, and to ask you to strengthen them before finalization.

Several provisions represent some of the strongest standards in the nation, and I am pleased that the regulations:

- * Covers both new and existing sources,
- * Uses better science, evaluating methane's impact based on its 20-year impact rather than 100-year value,
- * Requires comprehensive quarterly inspections of equipment that is designed to vent (like pneumatic controllers) and components that can leak
- * And includes key provisions moving California away from venting and flaring wasted gas, a strategy that limits both climate pollution and smog-forming gases that harm human health.

But there are also several key improvements I would like to see. Please update the final rule to improve elements of leak detection

OP-3-1

OP-3-2

and repair by eliminating provisions that currently allow for a reduction in inspection frequency. California communities also deserve a faster implementation timetable, meaning inspection requirements should start next year and not be delayed until 2018. Finally, your agency needs to look at all the benefits of reducing toxic air chemicals as part of its regulatory analysis, because only a full evaluation will show how cheap and effective these rules are and resist the oil and gas industry pushback.

OP-3-2
cont.

OP-3-3

OP-3-4

In strengthening and finalizing these critical rules, the California Air Resources Board will ensure that the Golden State remains a leader in clean energy and climate action."

OP-3-5

Please let me know if you have any questions or concerns about this submission.

Thank you for your consideration,

Heather Shelby
Activism & Engagement Manager
Environmental Defense Fund
(202) 572 3242
hshelby@edf.org

Attachment: www.arb.ca.gov/lists/com-attach/3-oilandgas2016-VxJXCQZEBxgAU1AU

Original File Name: EDF_CARB_OilAndGas2016.csv

Date and Time Comment Was Submitted: 2016-07-15 13:10:40

If you have any questions or comments please contact [Clerk of the Board](#) at (916) 322-5594.

[Board Comments Home](#)

Last_Name,First_Name,City,State,ZIP
Frable,Darren,Los Angeles,CA,90065-3214
Labay,Alice,Benicia,CA,94510-2332
MacKay,Ingeborg,Petaluma,CA,94954-4431
Ryan,John,Santa Cruz,CA,95062-4058
Salvatore,Shelley,Nevada City,CA,95959-8023
Paniagua,Raul,Chula Vista,CA,91911-5524
Torrise,Sharon,Hermosa Beach,CA,90254-2218
Lee,Peter,San Francisco,CA,94118-3556
Busch,Merri,Calexico,CA,92232-9011
Hernandez,Crystal,Torrance,CA,90501-4121
Dello Buono,Carmen,San Jose,CA,95123-2424
Brandon,Paul,Cupertino,CA,95014-2710
Ohlinder,Karenn,Gardena,CA,90249-3957
Mundstock,David,Berkeley,CA,94704-3119
Bostock,Vic,Altadena,CA,91001-1819
Roberts,Debra,El Dorado Hills,CA,95762-5520
Wlodarz,Adrian,Desert Hot Springs,CA,92240-7729
Decino,Paige,Carlsbad,CA,92008-3641
MacNeil,Vari,Cambria,CA,93428
Betti,Mark,Sherman Oaks,CA,91423-4530
Young,Rachel,Menlo Park,CA,94025-6551
Treacy,Carol,Petaluma,CA,94952-2634
Holmes,Melissa,Fremont,CA,94555-1146
Lozano,Luis,Long Beach,CA,90803-7230
Bills,Barbara,Placerville,CA,95667-4712
Forman,Joan,Redondo Beach,CA,90278-2811
Walker,Sandra,RSM,CA,92688
Young,Karen,San Francisco,CA,94118
Lynch,Susan,Pacific Palisades,CA,90272-3909
Thompson,Lawrence,Livermore,CA,94550-8134
Brigger,Kathy,Nuevo,CA,92567-8920
Longshore,Wally,Riverside,CA,92501-3551
Calhoun,Charles,San Francisco,CA,94115-3310
Brodyansky,Yuri,Santa Monica,CA,90403-5235
Logue,Regina,Sun City,CA,92586-0088
"Unger," John,Saugus,CA,91350-1990
Thilgen,Celia,Beaumont,CA,92223-7311
Stewart,Karen,Napa,CA,94558-4509
Mitchell,Hannah,Sacramento,CA,95818-3901
Gomez,Vanessa,Los Angeles,CA,90059-2208
Leiva,Miranda,Sherman Oaks,CA,91423-2279
URANWALA,JIMY,Pleasanton,CA,94566-6436
Stelzer,Samantha,Roseville,CA,95747-6384
Dragavon,Linda,San Francisco,CA,94114-3925
White,Kay,Sonoma,CA,95476-3119
Walp,Susan,Pasadena,CA,91103-2722
Boone,Foster,Etna,CA,96027-9414

Aram,Susaan,Laguna Beach,CA,92651-2829
Ramirez,Jessica,Westchester,CA,90045-3747
Johnson,June,Sebastopol,CA,95472-3570
Lewis,Beata,Sausalito,CA,94966-3146
Bedford,Pauline,Joshua Tree,CA,92252-2754
WILKEN,Sara,Newbury Park,CA,91320-3424
Schofield,Anna,Los Angeles,CA,90024-4838
Hov,Diana,Van Nuys,CA,91401-3942
Leto,Florence,Oakland,CA,94610-1322
Piner,Lisa,Costa Mesa,CA,92626-2066
Weaver,William,Lincoln,CA,95648-2631
Vernor,William,Yorba Linda,CA,92886-7402
McKenzie,Susan,Meadow Vista,CA,95722-9558
Sharp,Patricia,Grass Valley,CA,95945-7212
Howie,Linda,Fresno,CA,93730-1260
Fisher,Joan,Huntington Beach,CA,92647-2310
Kwid,Tony,Los Osos,CA,93402-1614
Abrahamian,Kevin,Glendale,CA,91202-2207
Watson,Fran,Spring Valley,CA,91977-5227
Stefancic,Stanley,San Rafael,CA,94901-1748
Osterhoudt,David,Rancho Santa Margarita,CA,92688-3246
Rodriguez,Joseph,San Jose,CA,95121-1535
Keshishian,Arin,Glendale,CA,91206-2252
Byrnes,Patricia,Mill Valley,CA,94941-3624
Howell,Sabrina,Lodi,CA,95240-3410
Paskus,Robert,Santa Monica,CA,90402-1524
Mehler,Maureen,Laguna Woods,CA,92637-8729
Heiler,Todd,Ferndale,CA,95536-0172
Searson,Douglas,Sausalito,CA,94965-2301
Silva,Dale,San Jose,CA,95110-1435
Hasenau,Carolina,Altadena,CA,91001-2318
Poon,Martina,Torrance,CA,90503-4104
Wool,Abigale,Long Beach,CA,90805-6910
Scott,Autumn,Escondido,CA,92026-6136
hernandez,jorge,Santa Rosa,CA,95404-8523
Albano,Galea,San Diego,CA,92123-1908
Kwiatek,A.,Roseville,CA,95747
Fiandaca,Anastasia,San Francisco,CA,94131-2421
Robin,Etta,Bakersfield,CA,93312-5824
Sabin,Carolyn,Chico,CA,95926-3445
Brown,Sarah,Grass Valley,CA,95945
Scharnagel,Jason,Concord,CA,94520-1677
Backus,Lee,Simi Valley,CA,93063-2003
Steiner,Amy,San Francisco,CA,94109-2704
Bentz,Keith,Brisbane,CA,94005-1649
Bowman,Candy,Placerville,CA,95667-9465
Boggs,Thomas,Inyokern,CA,93527-2412
Lee,Susan,San Diego,CA,92116-2312

Goldman-Hull,Sergi,Oakland,CA,94601-3823
Emery,Donald,Livermore,CA,94550-4006
Calbreath,Linda,Chico,CA,95928-9433
Sarne,Sabrina,Danville,CA,94526-5132
Chudilowsky,Barbara,Pacific Grove,CA,93950-3604
Toro,Juan,San Antonio,CA,35516
Johnson,Denise,Orange,CA,92866-1005
Krumdick,Kurtis,Visalia,CA,93292-4125
Radinovsky,K.,Chula Vista,CA,91910-3472
Biron,Deborah,Hayward,CA,94544-6815
Pinard,Zac,Pleasanton,CA,94588-3411
Anderson,Jeanie,San Diego,CA,92129-3812
Kasper,Sandy,Hemet,CA,92544-5019
Kaufman,Barry,Burbank,CA,91506-1525
Baker,Thomas,Newport Beach,CA,92663-4117
Boulton,Lynn,Lee Vining,CA,93541-0234
Tait,Ann,Pasadena,CA,91104-5030
Lawson,Ken,Cohasset,CA,95973-9048
Cachopo,Ron,Santa Clara,CA,95051-3842
Schenck,Alan,Sunnyvale,CA,94087-5231
Abbot,Marrisha,Boulder Creek,CA,95006-9564
Gonzalez,Daniel,San Diego,CA,92129-3819
Itzenhauser,Diane,Los Osos,CA,93402-4323
barrymore,susanne,santa barbara,CA,93105
McCollum,Sudi,Glendale,CA,91206-1419
Yellin,Shane,Carlsbad,CA,92008-4218
Matson,Gregg,Elk Grove,CA,95624-2728
Louie,Denise,San Francisco,CA,94131-2815
Ong,Paula,San Carlos,CA,94070-4931
Edwards,Judith,Mendocino,CA,95460-1187
Preston,Astrid,Santa Monica,CA,90403-2340
Scripps,Keith,Los Angeles,CA,90066-4805
Isbell,Donald,Carlsbad,CA,92008-4241
Kuehn,Gary,Newhall,CA,91321-1914
Fuller,Mark,Carson,CA,90745-3653
Fry,Charles,Sunnyvale,CA,94085-3459
Brown,Damon,Los Angeles,CA,90016-5229
Crockett,Leslie,San Rafael,CA,94901-3830
Weisenfelder,Margaret,Monrovia,CA,91016-7945
Gold,Warren,Mill Valley,CA,94941-5080
Schreier,Bryna,Burbank,CA,91504-1203
Chang,Nicole,San Francisco,CA,94111-1956
Ades,Anu,San Francisco,CA,94123-2405
Marko,Joe,Palm Desert,CA,92211-8904
Gray,Charlotte,Hemet,CA,92544-5236
Myers,Jean M,Gilroy,CA,95020-8811
Morgan,Kathleen,Chula Vista,CA,91911-1641
niksadat,aleta,san jose,CA,95112

Vatter, Sherry, Los Angeles, CA, 90034-8105
Ferguson, Donna, Alturas, CA, 96101-9010
Burtness Prak, Karen, Menlo Park, CA, 94025-5201
Dyakon, Douglas, Los Angeles, CA, 90069-1313
Kabat, Tom, Menlo Park, CA, 94025-2827
Ziegler, Herbert C., Yucaipa, CA, 92399-4612
Vigil, Michelle, Riverside, CA, 92517-1198
stringer, jane, Point Reyes Station, CA, 94956-0064
Fishbein, Michael, Los Angeles, CA, 90025-1829
Rainie, James, Fort Bragg, CA, 95437-2265
MORGAN, ROBERT, San Francisco, CA, 94114-3131
Colotti, Deborah, Sebastopol, CA, 95472-4839
Bostick, Thomas, Whittier, CA, 90604-3508
Dunlap, Irene, Newport Beach, CA, 92660-3618
Swarthout, Elizabeth, Richmond, CA, 94805-2079
Taira-Lin, Christine, Irvine, CA, 92614-7097
Duran, Alan, Sacramento, CA, 95831-4423
Molloy, Isabel, San Francisco, CA, 94121-3427
Etgen, Benjamin, Sacramento, CA, 95821-3128
Smith, Julie, Los Osos, CA, 93402-4006
Kriss, Evan Jane, Sausalito, CA, 94965-2066
Sage, Sandra, North Tustin, CA, 92705-3157
Ostro, Linda, Oakland, CA, 94611-2621
Sutton, Constance, Berkeley, CA, 94707-1913
Brown Capt. USAR (Ret.), Barry, Woodland Hills, CA, 91364-1923
Rezek, N, Altadena, CA, 91001
Hageman, Ellen, Culver City, CA, 90230-4459
Ritenour, Helen, Porter Ranch, CA, 91326-1632
Davis, Yvonne, San Diego, CA, 92111-3245
Woodward, Laurel, Cerritos, CA, 90703-1433
Raible, Annette, Petaluma, CA, 94952-9687
Cavanaugh, Michael, Redondo Beach, CA, 90278-3861
winchester, stewart, Richmond, CA, 94805-1226
Beard, Valerie, Sacramento, CA, 95820-3021
Wright, Dale, Ramona, CA, 92065-6813
Yaskin, Kyle, Los Angeles, CA, 90046-2133
Karp, Chuck, Palm Desert, CA, 92261-4423
Williams, Sara, Sherman Oaks, CA, 91423-1199
Hunt, Donna, Atascadero, CA, 93422-1801
Olson, Craig, Santa Rosa, CA, 95404-2212
britton, lauren, montara, CA, 94037
Rodriguez, Wilfredo, Campbell, CA, 95008-6266
Ackerson, Dinah, Pittsburg, CA, 94565-4479
Ladue, Patricia, Ojai, CA, 93023-4923
Israel, Kenneth, San Diego, CA, 92127-2613
Horowitz, Carol, Los Angeles, CA, 90025-2891
Sigler, Teri, Santa Cruz, CA, 95060-5730
Aram, Susaan, Laguna Beach, CA, 92651-2829

Corrigan, Jennifer, Newbury Park, CA, 91320-5214
Giguere, Ed, Gold River, CA, 95670-7617
de Kwaadsteniet, Tina, Los Angeles, CA, 90290
Battistessa, Gerri, Petaluma, CA, 94952-4115
Fish, Joan, Lakewood, CA, 90712-3526
Howard, Sandra, Studio City, CA, 91604-2630
Wehrman, Karen, Castro Valley, CA, 94546-1221
Gunther, Blanche, Poway, CA, 92064-3015
Lamb, Michael, Thousand Oaks, CA, 91362-5315
Butler, Clarence, Redlands, CA, 92374-6312
Aycock, Chris, San Francisco, CA, 94116-3039
Vossoughi, Siamak, San Francisco, CA, 94115-2138
Hamilton, Wendy, Escondido, CA, 92027-1043
Castner, Lorelee, Oakland, CA, 94611-4401
Greenspan, Burt, Novato, CA, 94947-5201
Carr, Patrick, Arcata, CA, 95521-6862
Miller, Scott, Oakland, CA, 94608-2810
Rocha, Nes, Oakhurst, CA, 93644-9461
Soucy, Constance, San Diego, CA, 92117-3123
Ritts, Cierna, Garden Grove, CA, 92840-1437
Rollins, Kathryn, Costa Mesa, CA, 92627-2347
Hill, Stephen, San Leandro, CA, 94578-1734
Pinto-E-Costa, Michelle, Glendale, CA, 91205-3738
Vankampen, Art, Pasadena, CA, 91104-2249
Eden, Jonathan, Berkeley, CA, 94707-1520
Law, Patricia, San Diego, CA, 92102-1232
Flitcraft, John, Cambria, CA, 93428-5840
DeLander, Kathleen, South San Francisco, CA, 94080-2238
Stroet, Peter, Santa Cruz, CA, 95060-4213
Thornton, Laura, Laguna Niguel, CA, 92677-7418
Thomason, Anita, Culver City, CA, 90230-4943
Barkan, Howard, Berkeley, CA, 94708-1854
Zollman, Zachary, San Diego, CA, 92103-1641
Lovejoy, Sue, Auburn, CA, 95602-8949
Mulugeta, Menilek, Prunedale, CA, 93907-3354
Larsen, Ady, Brisbane, CA, 94005-0726
Schmid, Linda, Mountain View, CA, 94043-1126
Kaczowski, Delphis A, Fontana, CA, 92331-0035
Kristenson, Linda, Atascadero, CA, 93422-3135
Robles, Renee, Garden Grove, CA, 92843-2741
Reed, Wayne, Mira Loma, CA, 91752-1626
Saitta, Martin, San Diego, CA, 92115-1312
calderon, jesse, Baldwin Park, CA, 91706-4431
Mont Eton, Jean, San Francisco, CA, 94116-2068
Voss, Cassandra, Porter Ranch, CA, 91326-1027
Price, Tyler, Davis, CA, 95616-4703
Yoon, Jinah, San Jose, CA, 95111-3849
Arnold, Carlos, Santa Maria, CA, 93455-2329

Bogart, Leslie, Santa Monica, CA, 90405-2720
Mercer, Allison, Royal Oaks, CA, 95076-9259
Altman, Peter, Davis, CA, 95616-3040
Lim, Olivia, Fremont, CA, 94539
Melin, Jeff, Santa Cruz, CA, 95060-1920
Hall, Chris, San Diego, CA, 92120-2911
Jacobel, Richard, Oakhurst, CA, 93644-4238
Zakar, Barry, Benicia, CA, 94510-0422
Akagi, Wayne, San Leandro, CA, 94577-1929
Lawrence, Katherine, San Jose, CA, 95110-2473
Robbins, Virginia, Altadena, CA, 91001-1958
Levinger, Ezra, Inverness, CA, 94937
de Los Angeles, Mariposa, Sausalito, CA, 94965-1788
Nyne, Kare, Oakland, CA, 94601-4354
Rose, Chris, Petaluma, CA, 94952
Swanson, Karen, Corona, CA, 92880-0942
Evans, Hilary, San Pedro, CA, 90731-6732
Andrews, Jean, Santa Cruz, CA, 95060-2505
Verschoor, Steven, Newbury Park, CA, 91320-2836
Jones, Melanie, San Pedro, CA, 90731-6979
Henriksen, Steve, San Diego, CA, 92101-8101
Carr, Colleen, San Diego, CA, 92128 2538
Holtzclaw, John, San Francisco, CA, 94133-4255
Lenchner, Nicholas, Santa Rosa, CA, 95403-1543
Arns, John, San Francisco, CA, 94110-3441
Gallegos, Mark, Los Angeles, CA, 90033-3111
van arsdale, dg, Burlingame, CA, 94010-4306
Peeler, Carlos, San Francisco, CA, 94102-2886
Alongi, Susan, Sacramento, CA, 95825-6403
Rrennacker, Ann, Fort Bragg, CA, 95437-4124
Nieman, Virgil, Desert Hot Springs, CA, 92241-8398
Oyama, Ken, Yorba Linda, CA, 92886-4916
Jackson, Gregory A., Los Angeles, CA, 90042-3413
tesluk, dawn, Oceanside, CA, 92054-5727
Martin, Dave, Boonville, CA, 95415-1059
Davenport, Rita, Lake Elsinore, CA, 92530
Bornheimer, Thomas, San Francisco, CA, 94115-1103
Baron, D. R., Sherman Oaks, CA, 91403-5002
Packer, Tara, Sherman Oaks, CA, 91403-4513
Cowley, Wayne, Camarillo, CA, 93010-9282
Fitzgerald, Stan, San Jose, CA, 95135-2129
Head, Kris, Garden Grove, CA, 92843-1078
Perez, Brenda, Los Angeles, CA, 90042-3916
Richardson, Katherine, Pleasant Hill, CA, 94523-4521
Millholland, Hope, Portola Valley, CA, 94028-8631
Kent, David, Windsor, CA, 95492-9401
Gould, Stephanie, Cambria, CA, 93428-2913
Dunaway, Matthew, Bishop, CA, 93514-2954

Jolliff,Crystal,Chico,CA,95926-3514
Scherzer,Teresa,San Francisco,CA,94110-5622
Varni,Matt,San Diego,CA,92108-6739
Argall,C.,Palm Desert,CA,92260-4962
REEL,JOSEPH,Pacific Grove,CA,93950-6066
Cotton,Melinda,Long Beach,CA,90803-0310
lenhart,Cameron,Willits,CA,95490-7724
Lupenko,Andy,Lemon Grove,CA,91945-2615
Mossman,Michael,La Crescenta,CA,91214-3144
Sanford,Ken,Escondido,CA,92029-4307
Shandelson,Brandon,Santa Clarita,CA,91390-5826
Weeks,Carey,Atascadero,CA,93422-6855
Pringsheim,Erika,Lafayette,CA,94549-3126
Boujikian,Caitlin,Lomita,CA,90717-1340
D,Laura,Albany,CA,94706-1525
Baird,Jennifer,Bakersfield,CA,93306-7641
Zimmerman,Julie,Sherman Oaks,CA,91423-4226
Kobayashi,Anne,San Diego,CA,92122-5630
Hertel,Caitlyn,Rocklin,CA,95765-5711
Hann,Suzi,Sacramento,CA,95835-2239
Galvan,Jose G,Anaheim,CA,92801-4253
O'Brien,Matthew,San Diego,CA,92129-4453
Bustamante,Ada,El Cerrito,CA,94530-3619
Phillips,Patricia,North San Juan,CA,95960-0363
Grijalva,Antonio,Los Angeles,CA,90068-1438
Benton,Annette,Antioch,CA,94509-7032
Carpenter,James,Oakland,CA,94619-2817
Wheadon,Janice,Napa,CA,94558-5347
Smalley,Mary,Los Angeles,CA,90045
Carlson,Patricia,Lincoln,CA,95648-8752
McCloskey,Deborah,Laguna Woods,CA,92637-2737
Reid,Matthew,Calistoga,CA,94515-1737
Greene,M J,Studio City,CA,91604-3024
Reitz,Dan,Corona Del Mar,CA,92625-2328
Bird,K,Pasadena,CA,91107-4326
Eller,Belen,Los Angeles,CA,90065-2506
Ruth,Carol E.,Stanford,CA,94305-8403
Levin,Michael,San Francisco,CA,94131-1934
Brown,Dawn,Encino,CA,91316-3502
Cohn,Barbara,Carlsbad,CA,92010-7072
Haley,Mary,Elk Grove,CA,95758-7134
alarcon,melissa,Fresno,CA,93728-2216
Cui,Michael,Los Angeles,CA,90035-3383
Willis,Jennifer,San Francisco,CA,94117-3516
Pease,Mutsuko,South El Monte,CA,91733-3851
Magill,Michael,"Granite bay, ca",CA,95746
De Cecco,Jorge,Ukiah,CA,95482-3407
Pina,Michelle,Huntington Park,CA,90255-6231

Sullivan,Joan Paul Pj,Ventura,CA,93003-5267
Vu,Hoang,Milpitas,CA,95035-3907
Shimaoka,Earl,Sunnyvale,CA,94086-4911
Granlund,Fred,N Hollywood,CA,91601-1723
Tucker,Michael,Berkeley,CA,94703-2357
Loyd Shell,Mary,Ridgecrest,CA,93555-4203
Yoder,Pat,Oceanside,CA,92056-5423
Brenner,John,Glendale,CA,91204-1008
Nishizaki,Lela,Dixon,CA,95620-2624
Carin,Eli,jerusalem,CA,92386
Schultz,Judy,San Francisco,CA,94115-2927
Quinones,Carla,Santa Rosa,CA,95404
Chen,Jamie,Murrieta,CA,92562-5961
Williams,Ruby,San Francisco,CA,94112-2434
Brodie,Eileen,Folsom,CA,95630-3215
Reitan,John,San Francisco,CA,94110-2726
Snavely,Irene,Covina,CA,91724-3447
Canning,Thomas,Calabasas,CA,91302-2238
Porri,Barbara,Napa,CA,94558-2569
Somo,Salem,jamul,CA,91935
Caffrey,Cathleen,Santa Rosa,CA,95404-4714
Hansen,Karen,Burbank,CA,91504-3924
Harrell,Roger,Hermosa Beach,CA,90254-2617
Ancheta,Allen,San Francisco,CA,94116
Debbs,Joshua,Sacramento,CA,95823-5057
Goldberg,Susan,Glendale,CA,91202-1301
Benda,Hilarey,Los Angeles,CA,90035-1418
Harrison,Verna,Chatsworth,CA,91311-2245
atkins,ed,BIG BASIN,CA,95006
Dadpagouh,Eudora,Riverside,CA,92505-2914
Griffin,Pam,Camarillo,CA,93012-5671
Holliday,Phyllis,San Francisco,CA,94102-1244
Hill,Sheri,Santa Maria,CA,93458
Thomas,Ralph B & Janet R,Chula Vista,CA,91915-2156
Alford,Alice,Blythe,CA,92226-2323
Loe,Steve,Yucaipa,CA,92399-2337
Schonebaum,Judith,Oakland,CA,94602-2517
Masi,James,San Francisco,CA,94158-1593
Swan,Curtis,Long Beach,CA,90802-1164
Hansel,Ron,West Covina,CA,91790-1802
Bailey,James,Santa Barbara,CA,93110-1860
Maizel,Yefim,San Francisco,CA,94131-1621
mclaughlin,michael,Sacramento,CA,95826-1815
Frost,Amanda,Santa Barbara,CA,93105-2965
Padilla,Lawrence,Roseville,CA,95678-2141
Collins,Steven,San Francisco,CA,94107-5526
Wright,Rachel,Fawnskin,CA,92333
"Oliver Flores, Esq.",Nancy,Valencia,CA,91354-1838

Debus,Claudia,Oakland,CA,94605-4940
Zalon,Susan,Santa Barbara,CA,93110-2426
Sanders,Dennis,Encinitas,CA,92024-1539
Reader,Stephanie,Los Altos,CA,94024-4028
Osgood,Pamela,Grass Valley,CA,95945-4822
Ligammari,Marcie,Paradise,CA,95969-4264
Bruer,Ken,Santa Barbara,CA,93105
alexander,sue,Oakland,CA,94610-1202
Martini,Marytheresa,Adelanto,CA,92301-4802
Smith,Edwina,San Francisco,CA,94114-2323
Rubin,Linda,Jamul,CA,91935-3306
Berry,vic,Morro Bay,CA,93442-2617
Williams,Glen,Weed,CA,96094-9225
Rose,Mary,Berkeley,CA,94702-1438
Priovolos,Steven,Burbank,CA,91505
Jerugim,Lora,Los Angeles,CA,90048-4710
Harlow,Frank,Santa Barbara,CA,93101-3328
Gregory,Faye,Colton,CA,92324-2734
Jordan,Marty,San Mateo,CA,94401-2215
Miller,Barbara,Covina,CA,91723-3610
Polansky,Debra,Auburn,CA,95603-9456
Kemper,Erik,Mission Viejo,CA,92692-2231
Price,Michael,Los Angeles,CA,90024-5164
Gerbitz,Gordon,Santa Barbara,CA,93101-3478
Routledge,Judith,Los Angeles,CA,90077-3150
Kurz,Robert,Laguna Niguel,CA,92677-2343
Frost,Anne,Richmond,CA,94804
Noordyk,James,San Diego,CA,92109-2802
Carpenter,Clara,Alameda,CA,94501-3334
Bass,Sandy,Sunnyvale,CA,94087-0374
Stratton,Anthony,Elk Grove,CA,95624-2148
Chen,Sonny,San Gabriel,CA,91776-1890
fox,angela,Desert Hot Springs,CA,92240-9550
Dudan,Donald M,Walnut Creek,CA,94596-6312
garcia,erin,Sherman Oaks,CA,91403-3414
Farris,Dannean,San Rafael,CA,94901-1787
Neft,Darrell,Costa Mesa,CA,92626-2324
Venkatraman,Krishna,San Francisco,CA,94129-1078
Jonaitis,Charles,Los Angeles,CA,90046-2209
Harrington,Eileen,Oakland,CA,94610-1466
Silen,Stephan,San Anselmo,CA,94960-1134
parker,jeff,Oakland,CA,94612-1042
Carr,Gaile,Mount Shasta,CA,96067-9617
Kubota,Charleen,Oakland,CA,94611-1221
Stossier,Kathleen,Huntingtn Bch,CA,92646-6906
Kone,Karen,Redding,CA,96002-0824
Fallender,Deborah,Santa Monica,CA,90405-2828
Collings,Cathy,Nevada City,CA,95959-1921

Sparks, Don, Northridge, CA, 91325-2049
Comstock, Mary-Ann, Huntington Beach, CA, 92646
Murphy, Donna, Riverside, CA, 92504-1337
Eames, Lee, Long Beach, CA, 90815-5127
Russell, Patrick, Oakland, CA, 94618-1651
Lozano, Luis, Long Beach, CA, 90803-7229
Bryan, Phillip, San Francisco, CA, 94122-2906
Harris, Norma, Santa Monica, CA, 90403-1313
Wass, Shawn, San Diego, CA, 92111-2506
Conn, Joel, Irvine, CA, 92618-4092
Douglas, L, Penngrove, CA, 94951-0502
oliveria, anthony, Elk Grove, CA, 95624-3005
Montoya, Jason, Bakersfield, CA, 93308-4660
Carroll, June, Oakland, CA, 94605-4639
Mejia, Raul, Studio City, CA, 91604-1240
Beumaher, Samantha, Lakeside, CA, 92040-5000
Harris, David, Ventura, CA, 93003-1906
Weininger, Gail, Alameda, CA, 94501-1152
Haskell, Warren, Chico, CA, 95926-2422
Skolnick, David, Berkeley, CA, 94710-2304
Theriault, Stacy, Los Angeles, CA, 90028-3910
L, thomas, Los Angeles, CA, 90039-1624
Hammarlund, susan, Porter Ranch, CA, 91326-1960
Brigger, Kathy, Nuevo, CA, 92567-8920
Lifton, Paul, El Cerrito, CA, 94530-2711
Mann, Julie, Campbell, CA, 95008-3261
Veltri, Joe, Valley Center, CA, 92082-5844
Fleming, Joseph, Daly City, CA, 94014-1441
Graff, Janet, Pasadena, CA, 91101-4244
Hankey, Stephanie, San Diego, CA, 92109-1119
Freitas, Steve, Ben Lomond, CA, 95005-9211
Olson, Margie, Vacaville, CA, 95688-3808
Rooney, Diane, El Cerrito, CA, 94530-1962
Helgason, Lesle, Pebble Beach, CA, 93953-3043
Darga, Leslie, Studio City, CA, 91604-2169
T, R, Los Angeles, CA, 90025
Kimball, Diane, American Canyon, CA, 94503-4144
Saravanja, Natasha, San Francisco, CA, 94131-2013
DePinto, Art, Oceanside, CA, 92056-6337
Bleha, Patricia, Carlsbad, CA, 92009-7830
obre, kathleen, Laguna Beach, CA, 92651-3036
Nguyen, Phuong, Milpitas, CA, 95035-3227
Johnstone, Penelope, Mariposa, CA, 95338
Stebbing, Barrie, Stinson Beach, CA, 94970-0449
Habegger, Sue, Grass Valley, CA, 95949-9140
Sitnick, Joan, Encino, CA, 91436-3836
Di Ciano, Aaron, Soquel, CA, 95073-3034
Charles, Kelly, Placerville, CA, 95667-8749

Monroe,Miles,Huntington Beach,CA,92649-3272
Grubbs,V.,San Diego,CA,92126-3509
McCartney,Sharon,Ventura,CA,93003-1222
Kratt,Stephen,Vallejo,CA,94591-8352
Havassy,Nancy,Oakland,CA,94611-2149
Puleo,Ron,Stockton,CA,95207-1338
Huber,Anne,Los Gatos,CA,95032-3805
Grote,John,Oakland,CA,94610-3358
SANIN,MARGARITA,Palmdale,CA,93550-6563
White,Mindi,Los Angeles,CA,90048-9440
Alvarado,Liliana,Rancho Cucamonga,CA,91729-1022
Prendiville,Jerami,Santa Rosa Valley,CA,93012-9311
westerfield,anne,Portola Valley,CA,94028-7667
Preston,Lynne,San Francisco,CA,94107-2688
Coolidge,Anita,Cardiff,CA,92007-1043
Ervast,Roger,Redlands,CA,92373-7109
Judy,Paul,Van Nuys,CA,91405-1547
Lapolla,Joann,San Diego,CA,92122-5318
Sangster,Carol,Ojai,CA,93024-0149
Jerlstrom,Jennifer,Anaheim,CA,92804-1663
Emhardt,Alana,Santa Monica,CA,90405-4246
james,christopher,Nevada City,CA,95959-2435
Graves,Caryn,Berkeley,CA,94702-1329
Bergmann,Barbara,Sacramento,CA,95821-5232
Langley,Billie Lee,Torrance,CA,90501-3529
Chaney,Herman,Oakland,CA,94612-4052
Roberts,tina,Elk Grove,CA,95758-7426
Gallego,Laurie,Stockton,CA,95210-1750
Fitzpatrick,Tom,West Hollywood,CA,90048-2564
Wolf,Robert,Brentwood,CA,94513
Bell,Greg,Atascadero,CA,93422-4154
Sparks,Rick,Toluca Lake,CA,91602-1002
Lieberman,Sharon,Annapolis,CA,95412-9752
Rosen,Sara-Ann,Los Angeles,CA,90025
sanchez,Sergio,Hemet,CA,92543-7108
Hackett,Sandy,Fortuna,CA,95540-2317
Gaus,Gil,Kings Beach,CA,96143-1252
Merson,Keith,Cool,CA,95614-9401
Easley,F,Burbank,CA,91502-2724
Hart,Johanna,San Francisco,CA,94116-1167
Stuart-Jennings,Erin,San Francisco,CA,94112-1604
Schaffer,Carol,San Pablo,CA,94806-1648
Benedict,J Lhesli,Nevada City,CA,95959-9541
Gill,Ayesha,Oakland,CA,94609-1110
Highlund,Sue,Newark,CA,94560-5421
Borame,Joan,El Cerrito,CA,94530-4118
Jacobs,Steve,Etiwanda,CA,91739-2377
McCullough,Sue,Oakland,CA,94619-1832

Thorpe, Patricia, El Cajon, CA, 92019-1004
Dutton, John, Santa Barbara, CA, 93110-1504
Boghoskhanian, Shakeh, Porter Ranch, CA, 91326-4425
Quimby, Mary, Arcadia, CA, 91006-4753
C, Rich, Chula Vista, CA, 91911-4836
Gant, Brenda, Glendale, CA, 91208-1506
Galgocz-Deak, Angela, Monrovia, CA, 91016-2110
Heist, Roberta, Fort Bragg, CA, 95437-7743
Reese, Gary, San Clemente, CA, 92673-6900
Baker, Joel, San Jose, CA, 95118-2757
Hounshell, Nancy, Modesto, CA, 95358-0019
Goldstein, Roz, Greenbrae, CA, 94904-1106
Oda, John, San Francisco, CA, 94115-3500
Jensen, Shirley, Santa Maria, CA, 93454-5304
Nash, Thomas, Rancho Mirage, CA, 92270-3429
Kurucz, Laszlo, Lake Forest, CA, 92630-6731
Demasi, Greg, Concord, CA, 94524-1374
Zimmermann, John, Long Beach, CA, 90803-1530
Chamberlain, Richard, Concord, CA, 94518-3251
Rutsch, Tom, Elk Grove, CA, 95758-4126
Sabatini, Kathy, Fair Oaks, CA, 95628-5520
Charles, Connie, El Cajon, CA, 92020-1119
Weiss, Lizette, Fort Bragg, CA, 95437-4538
Seltzer, Mary Ann, San Marcos, CA, 92078-4513
Carraway, Kermit, Auburn, CA, 95602-9505
Llewellyn, Pamela, Berkeley, CA, 94702-1949
Cheeseman, Lorne, Irvine, CA, 92620-1953
Salof, Tanya, Arcadia, CA, 91006-5808
Tipayaosot, Cindy, Sylmar, CA, 91342-3842
Blaylock, Dawnell, Auburn, CA, 95602-8875
Alexander, Ann, Santa Rosa, CA, 95409-5825
Kramer, Virginia, Alameda, CA, 94501-3460
Breese, Alan, Auburn, CA, 95603-6006
Cionco, Eleanor, Roseville, CA, 95747-8810
Reed, Patty, Los Angeles, CA, 90035-1861
Kleist-Corwin, Julaina, Berkeley, CA, 94705
Clazie, Dorothy J., Petaluma, CA, 94954-8536
O'Loughlin, Daniele, Van Nuys, CA, 91405-3007
carroll, daniel, Palm Springs, CA, 92262-4005
Carter, Michelle, San Francisco, CA, 94104-4602
Milikien, Ben, Truckee, CA, 96162-0393
Bithell, Marianne, Arcata, CA, 95521-9212
Saucedo, Gilbert, Los Angeles, CA, 90015-1486
Janes, Patricia, Atascadero, CA, 93422-5542
masters, kanta, Encinitas, CA, 92024-2226
Gallagher, winnie, Oakland, CA, 94610-3545
mey, alexandra, lima, CA, 90823
Gargiulo, Matt, Palo Alto, CA, 94301-3821

Barth,N.,Beverly Hills,CA,90210-3107
Greene,Kelly,San Diego,CA,92106-2001
Babst,Christina,W Hollywood,CA,90069-5525
Hanley,Jim,Santa Rosa,CA,95407-7710
Kasdan,Sheldon,Los Angeles,CA,90035-3217
Anderson,Lynne,North Hollywood,CA,91606-3812
Silk,Gregg,San Mateo,CA,94402-1555
Andersen,Paul,Wildomar,CA,92595-9775
Erhorn,Walter,Spring Valley,CA,91979-1843
Ulloa,Amalia,La Puente,CA,91744-6113
Dutton,Laura,Los Angeles,CA,90004-3720
Annecone,Lisa,Santa Rosa,CA,95407-5499
Pennington,John,San Francisco,CA,94114-3413
Hanisee,Mark,Riverside,CA,92506-4708
Landon,Jessica,Long Beach,CA,90802-8135
Ramstrom,Eric,Redding,CA,96002-5125
Meade,Pattie,San Clemente,CA,92672-3628
Rogers,Margaret,Redwood City,CA,94062-1315
Salvas,Kathleen,Woodland,CA,95695-5075
Pfister,Courtney,Hermosa Beach,CA,90254-3100
Wilkinson,Norm,Whittier,CA,90605-1122
Webster,Frank,Sun City,CA,92585-8825
Comfort,David,Santa Rosa,CA,95404-3018
Merrin,James,Thousand Oaks,CA,91362-1601
Ervin,Birdie,Carson,CA,90746-1517
Berendsen,Carol,Diablo,CA,94528-0927
Bishop,Walter,Port Hueneme,CA,93041-1801
Durkin,Carla,San Francisco,CA,94110-1103
Maxson,Ronald,Los Angeles,CA,90016-3205
Rhoades,Deanna,La Mesa,CA,91942-5069
Mattei,Eric,Canoga Park,CA,91304-3643
Hall,Heather,Newbury Park,CA,91320-2350
Ninde,William,Concord,CA,94521-5020
Benevento,Janet,San Jose,CA,95118-3916
Borchers,Margie,Santa Barbara,CA,93101-1138
Bein,Ann,Los Angeles,CA,90064-2026
mackillop,alan,San Diego,CA,92130-2660
Loperena,Lindsey,Santa Cruz,CA,95060-2309
Wilmes,Norm,Yuba City,CA,95991-6506
Robert,Diane,Oakland,CA,94610-3828
Lucas,Janie,San Francisco,CA,94110-3224
Frazer,Barbara,Sacramento,CA,95816-3937
Burns,Gary,Ceres,CA,95307-3403
Sanderson,Michele,Walnut Creek,CA,94595-3736
Cadosi-Wilson,Annette,Healdsburg,CA,95448-9131
Hunt,Lesley,Walnut Creek,CA,94598-3213
Cohen,Mitch,Berkeley,CA,94709-1024
Foulger,David,Apple Valley,CA,92307-3200

Ruge,Mox,Sherman Oaks,CA,91403-1711
Prince,Noelle,San Diego,CA,92111-3244
Fraga,David,Sacramento,CA,95822-2831
Mannava,Murali,Fremont,CA,94538-5224
Cadman,Susan,Vista,CA,92084-7226
Carter,Colleen,Canyon Country,CA,91387-4990
Wallack,John,Santa Rosa,CA,95403-1383
Steen,Larry,Los Angeles,CA,90035-4412
Safdie,Elliot,San Francisco,CA,94121-3439
Vera,Victor,Los Angeles,CA,90011-1445
Futterer,Joe,Topanga,CA,90290-4460
Stuart,Annie,Petaluma,CA,94952-1008
Wiesner,John,Castro Valley,CA,94546-8159
Culhane,Lesley Pamela,Camarillo,CA,93010-1108
Howerton,Carolyn,Valley Springs,CA,95252-9394
Sampson,Janice,Long Beach,CA,90815-3232
Sefton,John,Trabuco Canyon,CA,92678-0714
Seigerschmidt,Barbara,Whittier,CA,90603-2141
Brown,Emma,Sacramento,CA,95817-0546
Barron,Tiobe,Oak View,CA,93022-0469
Fishman,*First Name,San Jose,CA,95123-2639
Lilly,Susan,Winnetka,CA,91306-4242
S.,Ron,HP,CA,95233
Kowzan,Donna,Moorpark,CA,93021-2844
Thomsen,Gary,Newport Beach,CA,92661-1409
Zajdowicz,Thad,Pasadena,CA,91105-1768
Gize,John,San Jose,CA,95118-3924
Leinwand,Allen,San Jose,CA,95124-2037
Alexander,Zsanine,Burbank,CA,91504-2702
Lyons,William,Palos Verdes Peninsula,CA,90274
Williams,Judd,Mill Valley,CA,94941-2153
Reynolds,Ned,Solana Beach,CA,92075-1550
Ramsey,Ian,Hollister,CA,95023-6605
Heinecke,Cheryl,San Clemente,CA,92673-2755
Cardella,Sylvia,Hydesville,CA,95547-9416
Danner,Steve,Morgan Hill,CA,95037-5907
Halligan,Michele,Chico,CA,95928-4012
Przybylski,Laurel,Oakland,CA,94605-2903
Connick,Cherie,Crescent City,CA,95531-9677
Carlson,Jan,Alameda,CA,94501-2830
Ng,Carol,Los Angeles,CA,90026-1502
Berry,David,Los Angeles,CA,90024-5756
A,I,Fresno,CA,93707
Cypis,J.,LA,CA,90068-1373
Neal,Michael,Loomis,CA,95650-8401
Jacob,Ron,San Jose,CA,95117-2501
Landgrebe,Gary and Seraphina,Soquel,CA,95073-2523
Shore,Elizabeth Myrin,San Anselmo,CA,94979-2748

Emanuel, Frances, Simi Valley, CA, 93063-5782
Kawecki, Lewis, Kings Beach, CA, 96143-0096
Houston, Jim, Castro Valley, CA, 94546-1915
Parlette, Karen, Eureka, CA, 95501-5626
Espinoza, Roberto, Alhambra, CA, 91802-6278
Obrien, Kathy, Redway, CA, 95560
Bishop, Mark, San Jose, CA, 95112-5426
Barbush, Christopher, Vacaville, CA, 95687-8234
Ashlley, Hope, San Francisco, CA, 94105-2009
Hicks-Severn, Percy, Thousand Oaks, CA, 91320-5314
Robbins, Richard, San Rafael, CA, 94901-2946
Aspen, D., Santa Barbara, CA, 93120-2247
greene, jim, Chico, CA, 95926
Cymes, Lenore, Palo Alto, CA, 94303-3119
Kroeger, Scott, Costa Mesa, CA, 92627-4165
Lowry, Lorraine, Etobicoke, CA, 90211
Larue, Pamela, Long Beach, CA, 90808-2417
noh, kerry, Oakland, CA, 94612-1708
Gowani, Nancy, Winnetka, CA, 91396-2533
Mason, Marcie, San Diego, CA, 92111-7718
Britton, Joanne, San Diego, CA, 92115-4201
Gasperoni, John, Berkeley, CA, 94703-1313
Dunn, Scott, Santa Cruz, CA, 95060-4434
Grogan, Patty, Salinas, CA, 93907-1684
Lora, Juan, Los Angeles, CA, 90064-4740
Hubbard, James, Los Angeles, CA, 90018-1027
Maker, Janet, Los Angeles, CA, 90024-3113
Mello, Brian, Carmel Valley, CA, 93924-9553
Philips, Wesley, El Segundo, CA, 90245-3803
Barquera, Susan, Cerritos, CA, 90703-7645
Napier, Tamara, Newbury Park, CA, 91320-2056
Hunter, Konrad, Palmdale, CA, 93590-0755
Meyers, Donna, Long Beach, CA, 90814-1502
Masek, Margaret, Danville, CA, 94526-3739
Rich, Erin, Aptos, CA, 95003-5820
Bissonnette, Kevin, San Clemente, CA, 92672-2207
Dietrich, Cathe, Albany, CA, 94706-2336
Lidicker, Naomi, Kensington, CA, 94707-1235
Cliver, Frederick, Long Beach, CA, 90815-2041
Koo, Rebecca, San Diego, CA, 92108-2630
Sharee, Donna, San Francisco, CA, 94112-2829
Tuchman, Debra, Granada Hills, CA, 91344-5944
Reading, Roger, Huntington Beach, CA, 92649-4921
Archibald, Ingrid, Woodland Hills, CA, 91367-3022
Eggers, Karl, Long Beach, CA, 90815-2303
Hull, Roger, Torrance, CA, 90504-1733
Armbruster, James, Escondido, CA, 92026-3934
Fountain, Nicole, Fremont, CA, 94536-4325

Anderholm, Jon, Cazadero, CA, 95421-9580
Peteinaraki, Maria, heraklion city creta, CA, 71305
Hofman, Andrew and Geraldine, Valley Village, CA, 91601-4359
Thoele, Richard, San Fernando, CA, 91340-2228
Davis, William, Union City, CA, 94587-5164
Anderson, Heather, Fullerton, CA, 92833-2724
Mitchell, Brent, San Marcos, CA, 92078-5318
Lebrun, Karyn, Escondido, CA, 92027-4246
De Hart, Jane S., Santa Barbara, CA, 93108-1825
Baldwin, Tanya, Los Gatos, CA, 95032-3473
Tobe, Jerry, Los Angeles, CA, 90034-2809
Nelson, Timothy, none, CA, 92676
Keller, James, Sacramento, CA, 95864-3151
Lango, John, Berkeley, CA, 94708-1327
Taylor, Robert, Clearlake, CA, 95422-3300
Mulligan, Robin, Fountain Valley, CA, 92708-7251
Santiago, Leonardo, Colton, CA, 92324-4551
Lumer, Gilad, Marina Del Rey, CA, 90292-5952
Nulty, Thomas, Dana Point, CA, 92629-3007
Pollock-Leite, Jeri, Altadena, CA, 91001-3006
Barnes, Melinda, Carlsbad, CA, 92011-3966
Daniels, Bruce, Capitola, CA, 95010-1640
Hempel, Blake, San Carlos, CA, 94070-2330
Huth, Graciela, Los Angeles, CA, 90045-3707
Barthelow, Marilyn, Auburn, CA, 95602-9314
Parkins, Janet, Oakland, CA, 94611-5115
Youngelson, Noah, Los Angeles, CA, 90066-4134
Hollis, Kilah, Roseville, CA, 95747-7108
Filip, Thomas, Moorpark, CA, 93020-1332
Henderson, Rose, Los Angeles, CA, 90044-2419
Newman, Suzanne, Orinda, CA, 94563-2228
McCrumb, Hannelore, San Jose, CA, 95112-3428
hunt, linda, Berkeley, CA, 94702-1913
Lee, Michael, San Jose, CA, 95120-2232
Hayes, Tim, San Diego, CA, 92115-6938
Ellingwood, Mary, Santa Cruz, CA, 95062-1321
Walker, Sandra, RSM, CA, 92688
Unmack, Chanda, Santa Clara, CA, 95050-6171
Hildebrand, Karen, Santa Cruz, CA, 95060-5069
Benjamin, Elaine, Alpine, CA, 91901-2240
G., Randall, Berkeley, CA, 94703-2400
Hooper, Roger, San Rafael, CA, 94901-3483
Meier, Robert, Los Angeles, CA, 90042-2104
Abrell, Sarah, Carlsbad, CA, 92010-7922
John, Matthew, Marina Del Rey, CA, 90292-7389
Benedet, Carmen, Mill Valley, CA, 94941-3888
Irving, Christina, SONORA, CA, 95370
Meyer, Bonney, Sebastopol, CA, 95472

M,G,Pacifica,CA,94044
Carver,Georgia,Rancho Cordova,CA,95670-3636
Sadeghi,Shahla,Santa Monica,CA,90402-2725
Simmons,Ian,Truckee,CA,96161-2635
Nelson,Sally,Temecula,CA,92591-2025
Salmeron,Marjorie,Eureka,CA,95501-3706
kliche,diana,Long Beach,CA,90804-1201
Miotke,Jill,Costa Mesa,CA,92627-5527
Heinrichs,Charles,Oakland,CA,94619-1733
Johnson,Joel,Santa Cruz,CA,95060-4302
Pirie,Claire,Berkeley,CA,94703-2357
Fuchslocher,Bryna,Thousand Oaks,CA,91360-4846
Becker,Carol,Sherman Oaks,CA,91423-4017
Hathaway,Susan,Pico Rivera,CA,90660-2842
Bianco,Celeste,Sacramento,CA,95817-3643
Kilbourne,Bill,Rsm,CA,92688-2721
Weis,Joe,Reedley,CA,93654-2742
Lopez,Mary,Citrus Heights,CA,95610-6744
Peterson,Terry,Imperial Beach,CA,91932-2035
boyle,patricia,Menlo Park,CA,94025-7108
Bellini,Deborah,Santa Monica,CA,90405-2458
Burns,Lalie,Tracy,CA,95376-2726
Ingle,Evan,San Diego,CA,92104-2409
pardee,neal,Los Angeles,CA,90026-1112
Raleigh,Harold,Garden Grove,CA,92841-4825
Salerno,Mary,Temple City,CA,91780-3829
McCann,Ellen,Escondido,CA,92027-1401
Kelly,Chuck,Long Beach,CA,90803-3515
Ruggeri,Catherine,Hopland,CA,95449-0916
mulkey,sharon,Oceano,CA,93445-8961
Nilsen,K.,Ben Lomond,CA,95005
Mccauley,Patricia,Anaheim,CA,92807-1424
Torres,Armida,Sylmar,CA,91342-4256
Przybylski,Laurel,Oakland,CA,94605-2903
Messmer,Kim,Santa Clara,CA,95051-1154
Lutz,Irene,Canyon Cntry,CA,91351-1168
Cirul,Robin,Vallejo,CA,94590-8103
Cohen,Susan,Walnut Creek,CA,94597-3962
Utigaard,Nina,Richmond,CA,94804
Zebker,David,San Francisco,CA,94102-1685
Cunningham,Alan,Carmel Valley,CA,93924-9532
Nakamura,Irene,Arleta,CA,91331-5722
Rigrod,Carol,Encino,CA,91316-2702
Woodard,Margarette,Lake Arrowhead,CA,92352-1880
Mott,John,Sacramento,CA,95864-7153
MITCHELL, Lee,Kensington,CA,94707-1307
Hewett,John,Playa Del Rey,CA,90293-7942
Larsen,Nadine,Dana Point,CA,92629

Hicks,Anna Lee,Ojai,CA,93023-1940
Aguilera,Isela,Whittier,CA,90605-3125
North,Ellen,Laguna Niguel,CA,92677-1447
White,Danielle,Grass Valley,CA,95945-5348
Yrastorza,Teresa,Berkeley,CA,94702-2021
Goldberg,Daniel,Santa Cruz,CA,95060-2738
Graham,Gary,San Mateo,CA,94404-0391
Dirlam,Michael A.,Los Angeles,CA,90039-2418
Ruggiero,Rosalie,Napa,CA,94558
Futernick,Marc,Pasadena,CA,91106-4316
Boes,Sondra,Campbell,CA,95008-5123
Marcel,Lorretta,San Francisco,CA,94134-1220
Jones,Chris,El Segundo,CA,90245-3919
Roy,Hildy,Magalia,CA,95954-0886
Bransford,Tammy,Middletown,CA,95461-9753
Horne,Susan,Murrieta,CA,92562-9238
Waterhouse,Dennis,San Francisco,CA,94108-5506
Hyde,Kelly,San Jose,CA,95124-6234
Bondy,Sharon,Irvine,CA,92617-4039
Seal,Kathy,Santa Monica,CA,90405-2029
fiscus,donna,Vista,CA,92084-3424
Gervase,JoAnne,Del Mar,CA,92014-2420
Hirshik,Eric,Fairfield,CA,94534-7134
Eisler,Jonathan,Quincy,CA,95971
Dungan,Jan,Petaluma,CA,94952-2449
Magrath,Pat,Pomona,CA,91767-3566
Neely,Nancy,Pomona,CA,91767-1367
Armer,Joan,San Mateo,CA,94403-3966
Woodard,Jud,Sutter Creek,CA,95685-9632
Land,Martha,Concord,CA,94518-1324
Nagle,Donald,San Mateo,CA,94402-3605
Elia,Robert,Moraga,CA,94556-2739
Salois,Dawn,Costa Mesa,CA,92626-4129
Vaj,Marcy,Venice,CA,90291-3522
Phillips,Jack,Orangevale,CA,95662-4748
Stallard,Bob,Salinas,CA,93907-1015
Limtavamongkol,Alison,Los Angeles,CA,90025-3055
sohn,patricia,Palmdale,CA,93551-4615
Utzman,Anna,Mill Valley,CA,94941-5032
Harris,Shirley,Upland,CA,91784-2006
Scott,Sally,San Francisco,CA,94109-6915
Blevins,Patricia,San Jose,CA,95118-1808
Bodiford,Larry&Loretta,Soulsbyville,CA,95372-0579
Jain,Paula,Nevada City,CA,95959-2614
Linback,Peter,San Diego,CA,92110-1208
Balboa,Juan and Maria,San Jacinto,CA,92583-2850
schachter,sandra,Carmel Valley,CA,93924-9618
Partridge,Ronald,Simi Valley,CA,93063-6409

Whitson,Andrea, San Jose,CA,95118-1705
Forrester,Carole, San Luis Obispo,CA,93401-2509
Kuczynski,Kathleen,Lake Forest,CA,92630-3520
Hanlon,Steve, Los Angeles,CA,90049-2336
Davis,Carolyn,Grover Beach,CA,93433-2728
Gallegos,Geoffrey, San Francisco,CA,94131-2808
Whitley,Jerry,Laguna Hills,CA,92653
Frisch,Jo Ann,Livermore,CA,94550-8002
Threadgill,Michael,Winchester,CA,92596-0722
Schear,Roberta.,Oakland,CA,94618-1730
Davis,J, San Francisco,CA,94102-4000
Chafer,Clive,Oakland,CA,94619-1212
DeFelice,Paula,Richmond,CA,94803-2749
Kang,Irene, Los Angeles,CA,90066-3040
De La Torre,John,Vallejo,CA,94591-3876
Allen,Gary, San Francisco,CA,94114-1731
Althiser,Kenneth,Cherry Valley,CA,92223-3658
Hollahan,Gloria,Lompoc,CA,93436-7848
De Mio,Sabrina,Oakland,CA,94607-1409
Hauck,Ben,El Segundo,CA,90245-3905
Savage,Patricia,Mammoth Lakes,CA,93546-0100
Martinez,Donna,Mission Viejo,CA,92692-4073
E,Soraya,Concord,CA,94520
Zierikzee,R., San Francisco,CA,94118-2520
ADAMS,SPENCER, Los Angeles,CA,90034-5843
Acda,Joyce,Hayward,CA,94542-1219
Wilde,Nurit,Studio City,CA,91604
Lewis,Katherine, San Jose,CA,95134-2439
Hammond,David,Willits,CA,95490-8764
Saperia,David,Santa Monica,CA,90403-2972
Smith,Bret,Santa Cruz,CA,95063-2824
Webber,Rev. Joeline R.,Oroville,CA,95966-3876
Hock,Paula,Lancaster,CA,93534-1434
Ball,Jennifer,Vista,CA,92081-8953
McKernon,Diane,Carmichael,CA,95608-1844
Osborn,Kevin, San Diego,CA,92103-5056
Mone,Carol,Woodside,CA,94062-4806
Kohout,Susan,Vista,CA,92084-6332
Melton,Kathy,Rohnert Park,CA,94928-3924
McNulty,Susan,Downey,CA,90241-3924
Burtis,David,Calistoga,CA,94515-9785
Dutton,Lisa, Los Angeles,CA,90049-5044
Hacker,Mark,Baldwin Park,CA,91706-5613
Reed,Phyllis,Fresno,CA,93711-5907
Gillingham,Margaret,Costa Mesa,CA,92627-4863
burns,aspyn, San Diego,CA,92119-3040
Fukuda-Schmid,Kristina, Los Angeles,CA,90034-6910
Oliphant,Connie,Concord,CA,94520-5419

DeVore, George, Sausalito, CA, 94965-1408
King, Barbara, Los Angeles, CA, 90029-0448
Irwin, Yvette, Martinez, CA, 94553-3710
Walsh, Sharon, Lotus, CA, 95651
Flynn, Elizabeth A, Oceanside, CA, 92057-6449
Ingraham, Lara, Los Angeles, CA, 90038-3542
Spencer, Brent, Long Beach, CA, 90808-4105
Hofmann, Michele, Torrance, CA, 90503-1853
Koeninger, Laura, Ukiah, CA, 95482-3705
Steuer, Sharon, San Francisco, CA, 94110
Perea, Shawn, Garden Grove, CA, 92840-1716
Riley, Callie, Citrus Heights, CA, 95610-2514
Blythe, Frances, Dixon, CA, 95620-2464
Durkin, Samuel, Fairfield, CA, 94534-7400
Smith, Alta, Janesville, CA, 96114-9672
Davies, Karen, Fresno, CA, 93704-1813
Grebel, Tom, Santa Ana, CA, 92707-4142
Tivol, David, Sunnyvale, CA, 94087-4666
Kovacs, Steven, San Francisco, CA, 94116-1327
Fuehrer, Perry, Costa Mesa, CA, 92627-5553
Callahan, Robert, Santa Cruz, CA, 95060-9784
baville, mary, San Dimas, CA, 91773-3669
Molgora, Bianca, San Francisco, CA, 94110-6138
Pinckney, Fritz, Napa, CA, 94558-3756
Ford, Sharon, Orange, CA, 92866-1513
Ornelas, Maria, Newbury Park, CA, 91320-4653
Wilkes, Margaret, San Jose, CA, 95128-2143
Proctor, Deborah, San Luis Obispo, CA, 93401-5035
Wade, Maddy, Santa Monica, CA, 90403-3121
Nielsen, Steven, Santa Rosa, CA, 95403-1594
Murray, Barbara, Los Angeles, CA, 90041-2425
Marvin, Steve, West Sacramento, CA, 95605-2738
Ohriner, Rita, Carlsbad, CA, 92009-1722
Zelasko, Sandy, Valley Center, CA, 92082-7635
Varga, John, Huntington Beach, CA, 92648-5326
Tafoya, Ryan, Fontana, CA, 92337-7561
Fellner, Robin, McKinleyville, CA, 95519-8125
Lopez, LeeAnn, Winnetka, CA, 91306-2234
Mitnik, Tatyana, Woodland Hills, CA, 91367-7036
Ricard, Jean-Michel, Montecito, CA, 93108-1941
Denton, Bob, Costa Mesa, CA, 92626-3705
Alderette, Gary, Santa Rosa, CA, 95401-5748
Fogarty, Sheri, Encinitas, CA, 92024-5603
Allsop, Roberta, Long Beach, CA, 90803-6209
Whitworth, Greg, Los Angeles, CA, 90019-7301
Hubbard, Benjamin, Costa Mesa, CA, 92627-4537
Buchheim, Dennis, San Francisco, CA, 94103-1439
Esajian, Nancy, Oakland, CA, 94619-2580

Sumner, Laura, Auburn, CA, 95603-4642
Gervais-Vasquez, Rachelle, Concord, CA, 94519-2254
Rintye, Kahlil, San Francisco, CA, 94133-2317
Gatza, Margaret, Glendale, CA, 91202-1224
Smith, Virgie, Yucca Valley, CA, 92284-1360
Price, Marilyn, Mill Valley, CA, 94941-2074
Rice, Carolyn, Oakland, CA, 94609-1024
Knapp, Harry, Riverside, CA, 92507-2744
Aderhold, Steve, Fallbrook, CA, 92088-1135
neiman, jordan, Los Angeles, CA, 90068-2415
Barnes, Kate, Solana Beach, CA, 92075-1902
Deck, Don, Mammoth Lakes, CA, 93546-9796
Yamamoto, Alan, Newhall, CA, 91321-2247
Schwind, Janet, Santa Cruz, CA, 95060-2438
Massello, Ray, Sacramento, CA, 95822-1238
Carey, Joanne, Palo Alto, CA, 94303-3619
harbert, carmen, Redwood City, CA, 94061-1144
Stavelly, Jary, Fort Bragg, CA, 95437-3717
Dunn, Sheryl, San Diego, CA, 92128-4079
steinberg, penni, Tarzana, CA, 91356-5428
Rendessy, Chris, Santa Barbara, CA, 93101-1119
Eget, Mathew, Reseda, CA, 91335-2004
Goldberg, Valerie, Calabasas, CA, 91372-8212
davis, KATHERINE, San Clemente, CA, 92672-3315
Knauss, Ray, Rancho Palos Verdes, CA, 90275-2455
Smith, Bret, Santa Cruz, CA, 95063-2824
Schlegel, Matt, Palo Alto, CA, 94303-3042
Moreno, Henry, Valley Springs, CA, 95252-9164
B., Lois, Freedom, CA, 95019-0007
Walden, Sue, San Francisco, CA, 94109-3482
Rodriguez, Michael, Rosemead, CA, 91770-4110
Brown, James R, Los Angeles, CA, 90034-6251
Bachar, John, Los Angeles, CA, 90045-1631
Frounfelter, Earl, Santa Maria, CA, 93454-6644
Reder, Mary, Santa Rosa, CA, 95409-3809
Davis, Tammy, Los Angeles, CA, 90014-2311
Moreno, Patricia, Goleta, CA, 93117-5821
Paniagua, Rosiris, Altadena, CA, 91001-4408
Mueller, Gretchen, San Francisco, CA, 94110-5250
Fryman, Nicholas, Los Angeles, CA, 90066-6412
Thomas, Eva, Woodside, CA, 94062-4307
Sullivan, Christine, Corona Del Mar, CA, 92625-2600
Kessler, Kristen, Valencia, CA, 91355-4679
Gedo, Terri, Los Angeles, CA, 90045-1037
Hauswald, Christina, Kelseyville, CA, 95451-9057
Brown, Bill, Clovis, CA, 93613-3245
Fransz, Ron, Hermosa Beach, CA, 90254-3454
Lau, David, Mission Viejo, CA, 92692-5190

Heath,Paulette,Los Angeles,CA,90041-1545
Hayes,Christine,Upland,CA,91786-2161
Karkanen,Kellie,Walnut Creek,CA,94595-2603
Engle,Richard,Winnetka,CA,91306-4319
Thompson,S,Los Angeles,CA,90026-1425
Eliscu,Steven,Palo Alto,CA,94306-3144
Salzetti,Joe,Rolling Hills Estates,CA,90274-5102
Thompson,Dana,Los Gatos,CA,95032-7391
Kumar,Nusi,Walnut Creek,CA,94596
Sigel,Liz,Tustin,CA,92780-5579
Donald,Paul,San Francisco,CA,94103-5522
Yenney,Rob,Ventura,CA,93004
Burd,Judith Burd,Hesperia,CA,92345-4043
Shuster,Marguerite,Sierra Madre,CA,91024-1232
Grabowsky,Katarina,Castro Valley,CA,94546-2942
Loo,Chris,Morgan Hill,CA,95037-3864
Wagner,Inge,Los Angeles,CA,90020-2055
Sellars,Stefanie,Simi Valley,CA,93065-4752
O'Neill,Cara,Calistoga,CA,94515 9634
Henderson,Michael,Huntington Beach,CA,92649-2443
James,C.,Clovis,CA,93613-0032
Jones,Richard,San Diego,CA,92130-2463
Cooper,Lynne,Santa Cruz,CA,95060-5344
Dambrosio,Maria,Bermuda Dunes,CA,92203-9514
Dana,Krista,Sunnyvale,CA,94087-2241
Lewis,Ashley,Fairfax,CA,94930-2036
Ang,Joseph,Los Angeles,CA,90077-3419
Struthers,Sue,Riverside,CA,92506-2502
Fox,Donna,Alameda,CA,94501-4803
weiss,dean,Encino,CA,91436-1411
Robinson,Maurice,Manhattan Beach,CA,90266-7229
Nurse,Heidi,Fair Oaks,CA,95628-3435
Miller,Victoria,Encino,CA,91436-1541
Traber,Lucy,Mendocino,CA,95460
moffett,vera,Los Angeles,CA,90008-2623
Yaroslow,Rev Gregory,Redlands,CA,92373-8103
heron,joan,Fort Bragg,CA,95437-4204
Randeria,Perviz,San Francisco,CA,94118
Jackson,Bruce,Oxnard,CA,93033-9110
Pease,Mutsuko,South El Monte,CA,91733-3851
Kalous,Carole,Berkeley,CA,94704-1541
Wendell,John,Santa Rosa,CA,95403-2227
Hieda,Michael,Laguna Hills,CA,92653-5617
Goldman,Ron,Los Altos,CA,94024-6902
brooks,vicki,Palo Alto,CA,94301-1501
Campbell,Norma,Campbell,CA,95008-2424
Johnson,Elizabeth,Sebastopol,CA,95472-3160
Ovard,Michael,Long Beach,CA,90815-1245

Beveridge, Richard, Lompoc, CA, 93436-6607
Fiore, Mark J., San Francisco, CA, 94122-2120
Johansen, Cinda, Folsom, CA, 95630-7928
Rhazi, Carolyn, Mission Viejo, CA, 92691-5213
Whaley, Richard, Eureka, CA, 95503-8913
Lawler, Dan, Los Angeles, CA, 90028-4794
Beeler, A George, Petaluma, CA, 94952-2515
Richfield, Helen, San Geronimo, CA, 94963-0189
Binswanger, Lee, San Francisco, CA, 94110-3501
Zimmermann, John, Long Beach, CA, 90803-8031
Namasondhi, Ashley, Los Angeles, CA, 90004-1411
Allen, Dennis, Santa Barbara, CA, 93103-3201
Fonzo, Gregory, Foster City, CA, 94404-4127
Wyatt, Victoria, Crestline, CA, 92325-3351
Cope, Sandra, Irvine, CA, 92612-8621
Satriano, Joseph, San Diego, CA, 92122-5090
Burton and FAMILY, U, Santa Monica, CA, 90405-5311
Carlton, Tom, Culver City, CA, 90232-3719
Vadillo, Jolene, San Marcos, CA, 92069-1114
Olsen, Andrew, Los Angeles, CA, 90027-2758
Lane, Julie, Sebastopol, CA, 95472-5819
Thomas, Niklas, Bakersfield, CA, 93309-2026
Shaia, Gerald, Sun Valley, CA, 91352-4005
M, R, Rancho Cucamonga, CA, 91730-3974
Lyon, Anne, Rohnert Park, CA, 94927-1702
Kelley, Dean, Los Angeles, CA, 90045-1706
Hockley, Jim, Mariposa, CA, 95338-9053
Shepard, Dodie, Burbank, CA, 91505-2401
Lundin, walter, Palo Alto, CA, 94306-4081
Lowry, Kristen, Vacaville, CA, 95688-3853
hamilton, melody, trinidad, CA, 95570
Vega, Brenda, Duarte, CA, 91010-3507
Kendall, Jonathan, San Diego, CA, 92117-1422
Schwartz, Tom, Sunland, CA, 91040-3039
Chasmar, Philip, Coto de Caza, CA, 92679
DeMott, Margaret, Sacramento, CA, 95822-8309
Levine, Sharon, Simi Valley, CA, 93063-2827
Koenig, John, Los Angeles, CA, 90049-4206
Koessel, Karl, McKinleyville, CA, 95519-8168
Shand, Bonnie, Bayside, CA, 95524-9049
Iverson, Steve, Corona Del Mar, CA, 92625-2919
Moore, Richard, Sebastopol, CA, 95472-2132
McLean, Patricia, Nevada City, CA, 95959-8412
Wolfe, Jessica, Sebastopol, CA, 95472-2832
Kinaman, Scott, San Jose, CA, 95127-1261
Gustafson, Rae Ann, Mill Valley, CA, 94941-3432
boone, bruce, San Francisco, CA, 94114-2524
Burton, Betye, Pasadena, CA, 91106-4503

Riley,Nancy,Santa Ana,CA,92799-8891
Zamites,Marlene,Redondo Beach,CA,90278-4724
Ganter,Steven,Santa Barbara,CA,93101-4634
Ryan,Therese,Palmdale,CA,93550-2569
Smith,Lori,Cathedral City,CA,92234-6726
Parker,Sherry,Santa Monica,CA,90403-3913
Millette,Kari,Sacramento,CA,95831-3004
Wallace,V.R.,Whittier,CA,90602-2547
Wilson,Janae,Seal Beach,CA,90740-5728
Butt,Peter,San Pedro,CA,90731-2309
Mcrae,William,San Diego,CA,92109-4114
Deras Jr.,Frank,Napa,CA,94559-3911
Hudson,Catherine,Santa Cruz,CA,95065-9723
Touchstone,Lana,Vallejo,CA,94591-5738
Dallow,Karen,El Sobrante,CA,94803-1732
Bowman,Collin,Tahoe Vista,CA,96148
Andrea Graff,Al Novak And,San Francisco,CA,94131-2421
Cooluris,Helen,San Francisco,CA,94127-1304
Jones,v. & B.,City,CA,90510-5090
Levin,Shaun Marie,Redwood City,CA,94065-1786
Sullivan,Sharon,South Lake Tahoe,CA,96150-3059
Gatto,Gina,Castro Valley,CA,94546-2731
Noonan,Michael,Laguna Niguel,CA,92677-2345
Trujillo,Severita`,San Jose,CA,95128-1107
Hodges,Jodi,Lake Arrowhead,CA,92352
Ton-Olshaskie,Thi,Arroyo Grande,CA,93420
Gallardo,Charlotte,La Habra,CA,90631-7134
Pearce,Carol,Novato,CA,94947-1976
VANDENBOSCH,LIESBETH,San Diego,CA,92104-5639
Mede,Pattie,San clemente,CA,92672
HOPPING,FORREST,Los Angeles,CA,90032-3103
Dickey,Helen,El Cerrito,CA,94530-4151
Kierce,Linda,Cambria,CA,93428-3605
roberts,jacquelyn,Tehachapi,CA,93561-8581
Robinson,Rebecca,San Pablo,CA,94806-1568
Spencer,D R,San Diego,CA,92104-4645
Maves,John,Palm Springs,CA,92262-2321
Jung,Scott,South Pasadena,CA,91030-4134
Lewis,O,Los Angeles,CA,90009-7075
Jackson,Alicia,Vallejo,CA,94591-4114
Robinson,Joyce,Twentynine Palms,CA,92277-2534
Nitsos,Pamela,Fremont,CA,94538-5557
Shepherd,Jason,Oxnard,CA,93036-5362
Nachazel-Ruck,Jane,Los Angeles,CA,90026-1712
Lane,Joyce,San Diego,CA,92115-5444
Guilaroff,Jon,Inglewood,CA,90304-1062
Catechi,Nicole,San Mateo,CA,94402-2923
Flannigan,Brian,Rancho Palos Verdes,CA,90275-1221

Compher, Margaret, Santee, CA, 92071-1103
Iimura, Wallace, Cupertino, CA, 95014-2206
Miller, Carroll M., Santa Ana, CA, 92705-2356
Goldin, Martha, Los Osos, CA, 93412-6007
Eggers, Lynne, San Francisco, CA, 94110-5331
Newton, Laura, Cathedral City, CA, 92234-7845
Selzer, Michael, Bakersfield, CA, 93309-1249
Ridenhour, Robert, Hydesville, CA, 95547-9433
Takaki, Christina, Torrance, CA, 90503-2043
Pasqua, John, Escondido, CA, 92025-5005
Naegler, Hanne, Santa Rosa, CA, 95403-1109
Tenerowicz, Kristina, Kelseyville, CA, 95451-9284
Taine, Robert, San Francisco, CA, 94131-2554
McCollom, Dorothy, Huntington Beach, CA, 92646-2402
Smith, Nellora, Pasadena, CA, 91107-1457
Lapinski, Thomas, Greenbrae, CA, 94904-2318
Pryor, Lois, Alameda, CA, 94501-1681
Amari, R, Los Angeles, CA, 90025-3663
Sweeney, Ed, Vallejo, CA, 94589-1412
Johnson, Ashlee, Simi Valley, CA, 93063-3825
Blackwell, Savannah, San Francisco, CA, 94117-3735
Ton, Tung, San Diego, CA, 92116-2488
Clark, Warren, Mammoth Lakes, CA, 93546-3328
Doherty, Joanne, Simi Valley, CA, 93065-0621
Kahn, Rose, Scotts Valley, CA, 95066-4030
xavier, marjorie, Hayward, CA, 94542-2152
Tucker, Laurel, Claremont, CA, 91711-3741
Riber, Genevieve, San Diego, CA, 92103-1636
Ryan, Mary Jane, Walnut Creek, CA, 94595-1337
Cutler, Kirsten, Santa Rosa, CA, 95404-8518
Root, Charlene, Whittier, CA, 90602-3321
Burge, Dennis, Ridgecrest, CA, 93555-3308
Miller, Bob, San Jose, CA, 95136-4056
DeMeo, Edgar, Palo Alto, CA, 94306-2313
Sullivan, Michelle, Los Angeles, CA, 90027-5548
rider, heather, Los Angeles, CA, 90049
Simon, Leslie, Woodland Hills, CA, 91364-3234
Arthur, Paula, Westlake Village, CA, 91361-3601
Stein, Laurel, Auburn, CA, 95603-2828
Macleod, Pascale, San Francisco, CA, 94121-2507
B, Terri, Los Angeles, CA, 90095-0001
Ledesma, Audrey, San Diego, CA, 92115-6715
Lazell, Mavis, Santa Rosa, CA, 95404-3025
Barron, Tiobe, Oak View, CA, 93022-0469
Ramos, Paul, Santa Ynez, CA, 93460-0728
Crispi, Diana, Los Angeles, CA, 90034-1852
Tilden, Barbara, Victorville, CA, 92395-9466
Menders, Melanie, San Diego, CA, 92109-5024

Gorner, Susan, Sonoma, CA, 95476-8564
Kennedy, Sharon, Fullerton, CA, 92834-7051
Kearney, Kevin, Menifee, CA, 92585-3998
Thomson, James, Los Angeles, CA, 90065-3740
polito, nancy, Orangevale, CA, 95662-5418
Feusner, Jamie, Los Angeles, CA, 90019-3610
Teofan, Yvonne, Culver City, CA, 90230-4873
Kahn, Warren & Lisa, Sebastopol, CA, 95472-5744
Rasmussen, Mckenzie, Goleta, CA, 93117-2467
Gordon, Harriett, Santa Rosa, CA, 95409-3068
butler, sandra, Los Angeles, CA, 90045-2753
Ashley, Sam, Lancaster, CA, 93536
Macan, Catherine, Eureka, CA, 95501-2564
Corr, Carey, Newport Beach, CA, 92663-2732
Girocco, Janice, San Diego, CA, 92131
Reibstein, Karen, San Diego, CA, 92120-3108
Wilkinson, Judith A., La Jolla, CA, 92037-7216
Joe, Lawrence, Pasadena, CA, 91107-5557
Chase, Mary, Novato, CA, 94947-3714
Lindquist, Erin, Carlsbad, CA, 92008-1211
Willis, William, Costa Mesa, CA, 92627-2937
Jordan, lee, Los Angeles, CA, 90056-1906
Anderson, Leonard, Santa Cruz, CA, 95062-1821
Richards, Nancy, Santa Rosa, CA, 95404-2231
gray, pat, San Francisco, CA, 94118-1468
Dailo, Ginny, Rialto, CA, 92376-2928
Miller, Ken, Scotts Valley, CA, 95066
Clark, Mona, Los Angeles, CA, 90016-5030
Rojas, Deanna, Redwood City, CA, 94063-4311
Fuller, Marilyn, Los Gatos, CA, 95033-9537
Huerta, Rene, Montclair, CA, 91763-3433
Degrigoli, Vito, Palm Springs, CA, 92262-0322
Blanthorne, Olga, West Covina, CA, 91790-5020
Miller, Kelly, San Diego, CA, 92128-3835
Duncan, Janis, Ventura, CA, 93003-3959
Menjivar, Richard, Panorama City, CA, 91402-3816
Twombly, Karl, Palm Desert, CA, 92211-4553
Andersson, Joan, Topanga, CA, 90290-4277
Johnston, Moira J, Napa, CA, 94559-4744
Pena, Lorraine, Los Angeles, CA, 90025-6021
Lantz, Jamie, San Francisco, CA, 94110-4728
Sanchez, Eric, Long Beach, CA, 90804-1837
Zukoski, Katie, Chico, CA, 95928-9197
Blackman, Tera, Corona, CA, 92881-4168
Hydar, John, Ventura, CA, 93003-7123
Cocco, Brian, San Francisco, CA, 94134-3389
Allinson, Phyllis, Escondido, CA, 92046-2098
Noon, Gail, San Pedro, CA, 90731-7149

Richard Jr,Charles,Antioch,CA,94509-4847
Sanders,M,Petaluma,CA,94952-4123
Halperin,Vidal,Van Nuys,CA,91405-4113
Gutierrez,Emmylou,Fresno,CA,93710-3913
Eisenberg,Howard,San Mateo,CA,94402-3334
Gordon,Gayle -Lynne,Sherman Oaks,CA,91423-1911
Bailey,Sadie,Huntington Beach,CA,92648-2868
greenburg,stuart,Stevenson Ranch,CA,91381-1142
B.,Charles,Tarzana,CA,91356-1971
Raynard,Mirella,Camarillo,CA,93010-1845
Chavez,Esther,Northridge,CA,91324-3665
O'Rourke,Karen,Canoga Park,CA,91304-1005
Jones,Mike,West Hills,CA,91307-2409
Fachko,Denise,Buena Park,CA,90621-3324
Anderson,Christine,Lafayette,CA,94549-2221
NYCE,Eric,Hayward,CA,94544-6701
Friedman,Leanne,Davis,CA,95616-0853
Bowers,Carla,Volcano,CA,95689-0044
Smith,Robert,Glossop,CA,91409
murdoch,sarah,Pacific Palisades,CA,90272-3531
Formanek,Robert,Orinda,CA,94563-1222
Farina,Fran,Santa Barbara,CA,93111-1637
Hicks,Lacey,Union City,CA,94587-4578
Deamer,John,Mill Valley,CA,94941-3988
Johnson,David,Ventura,CA,93003-4736
Davenport,Susan,Simi Valley,CA,93063-7423
Sarbeland,Martha,San Mateo,CA,94403-1113
Kaplan,Adam,Laguna Beach,CA,92651-1845
Stewart,Pamela,Clearlake Oaks,CA,95423
Boutin,Dolores,Tuolumne,CA,95379-1450
Grant,Kathryn,Nevada City,CA,95959-0727
star,relf,Montclair,CA,91763-2959
Gosselin,John,San Francisco,CA,94122-3428
Engelhart,Marylee,Redding,CA,96003-3246
Rojas,Efren,Ontario,CA,91761-4245
Fears,Wendy,Irvine,CA,92604-3162
VL,Judie,BC,CA,95006
cardoza,jennifer,Piedmont,CA,94610-1523
von tress,kay,Menlo Park,CA,94025-3618
may,m,Carlsbad,CA,92008-1949
flango,cheryl,San Francisco,CA,94124-2335
Casey,Veronica,Navarro,CA,95463
ruby,jan,Woodside,CA,94062-4561
Johnson,Chad,Long Beach,CA,90806-5601
Hernandez,Eugene,Sylmar,CA,91392-0395
Wilson,Tanya,Glendale,CA,91202-1235
Sarff,Jennifer,San Diego,CA,92103-3782
Kelly,Mike,Huntington Beach,CA,92648-4916

Rogers, Donna, Irvine, CA, 92618-8073
Haley, Ann, Camp connell, CA, 95223-4356
Dawkins, Jan, Oceanside, CA, 92057-2631
Madrid, Robin, Mission Viejo, CA, 92692-3028
Zaydel, Laura, Moss Beach, CA, 94038-9795
Colden, Bradley, Whittier, CA, 90602-3112
Wolf, Nevada, Los Angeles, CA, 90034
Neely, Edward, San Francisco, CA, 94115-1724
Carson, Christopher, Burbank, CA, 91505-2831
Johnson, Judy, Placerville, CA, 95667-4929
Flores, Regina, Lake Elsinore, CA, 92532-2508
Rockwood, Karen, La Jolla, CA, 92037
Sasaoka, Julie, Concord, CA, 94518-1829
Taylor, R, los angeles, CA, 90025-4027
Bennett, JoAnne, Pleasanton, CA, 94588-8044
Naisbitt, Gloria, Santa Rosa, CA, 95404-6178
Fourchy, George, Fairfield, CA, 94533-9520
Lunn, Teri, Petaluma, CA, 94954-1526
Dunmeyer, Lisa, San Francisco, CA, 94103-1241
Walker, Verla D., West Covina, CA, 91791-2064
Brand, Dennis, Santa Cruz, CA, 95062-3321
Silverio, Alex, San Jose, CA, 95130-1251
Litwak, Maxine, Novato, CA, 94949-5347
Tietz, Richard, Lafayette, CA, 94549-5110
Peppard, Dean, Downey, CA, 90240-2622
bryan, bruce, Lancaster, CA, 93536-9036
Silveira, Luciano, Encino, CA, 91316-3110
Strasser, K, Martinez, CA, 94553-3369
Kissling, Elmon, Eureka, CA, 95503-9765
"myers, tower, morale", "mecky, jay, al, li", Redondo Beach, CA, 90277-3243
Minovitz, Wendy, Porter Ranch, CA, 91326-1703
Hindenlang, Kathryn, Huntington Beach, CA, 92646-5533
Duerr, J, Sacramento, CA, 95831-1840
Rodriguez, Irish, Calexico, CA, 92231-2300
stout, robert, Fairfax, CA, 94930-2003
Page, S, San Francisco, CA, 94107-2828
Camp, David, Burbank, CA, 91501-2637
Simon, Philip, San Rafael, CA, 94912-9473
Cupito, Caia, Redding, CA, 96003-8277
Chianis, Antonia & Andrew, Blue Jay, CA, 92317-0836
Bellem, Sarah, Felton, CA, 95018-9432
Mitton, Stephen, San Diego, CA, 92123-2222
Hulsey, Tamara, El Cajon, CA, 92021-3040
Fisk, Penny, Santa Monica, CA, 90405-3509
felsenthal, erica, Los Angeles, CA, 90064-2507
Schildgen, Bob, Berkeley, CA, 94703-1630
Higgins, Susi, Glendale, CA, 91203-1221
Maslana, Daniel, Pleasanton, CA, 94588-3687

Waldron,Linda,San Diego,CA,92103-1876
August,Jane,Los Angeles,CA,90078-0666
wyman,tom,Riverside,CA,92501-3054
Miller,David,Redondo Beach,CA,90277-2133
Mitouer,Cheryl,Gualala,CA,95445-8501
Maker,Janet,Los Angeles,CA,90024-3113
Menasakanian,Arin,Norwalk,CA,90650
Brewer,Laurel,West Hollywood,CA,90069-4063
Sanchez,Antoinette,San Lorenzo,CA,94580-3110
Kooiman,Cornelius,Encinitas,CA,92024-4500
Hixson,Leslie,Santa Ana,CA,92707-4921
Zylius,Patricia,Santa Cruz,CA,95062-2428
Morton,Anna,Nevada City,CA,95959-9712
Miller,A. M.,Sunnyvale,CA,94089-1814
Hauschild,John,Auburn,CA,95603-4921
Cuevas,Ana,Montclair,CA,91763-3628
Hennis,Norma-Jeanne,La Jolla,CA,92037-7134
Hancock,Autumn,Los Altos,CA,94024-0804
Skapik,John,Oakland,CA,94610-2402
Meehan,Don,San Jose,CA,95124-5939
Sprowl,Karen,San Diego,CA,92108-1809
Bellows,Kirsti,El Cerrito,CA,94530-2745
Krichman,Barbara,Foothill Ranch,CA,92610-2341
Tran,Kim,Santa Ana,CA,92707-4315
ralston,charles,Novato,CA,94949-6809
Denman,Jack and Margar,Fullerton,CA,92838-0062
Hebert,Joan,Menlo Park,CA,94025-1849
Riso,Jennifer,La Quinta,CA,92253-8011
Castrillon,Fernando,Albany,CA,94706-1164
Dashiell,Gwendolyn,San Pedro,CA,90731-3342
Maples,Claude,Frazier Park,CA,93225-1298
BOYD,CAROL,Escondido,CA,92027-4064
Downey,Angela,San Diego,CA,92109-4059
France,Jeremy,West Covina,CA,91792-1943
Legaroff,Kyra,Richmond,CA,94804-5451
Dowdle,Daniel,San Diego,CA,92103-4202
Schaden,Allan,Elk Grove,CA,95624-3038
Darling,Michael,Frazier Park,CA,93225-9614
Jung,Calvin,Burbank,CA,91505-3450
Roos,Irene,Lakeside,CA,92040-4614
Anderson-Miles,Eleanor,Richmond,CA,94804-4931
Beauvais,David,San Francisco,CA,94122-1547
Robinson,Lee,El Dorado Hills,CA,95762-9747
castillo,art,Riverside,CA,92506-4906
Zart,Nicolas,Long Beach,CA,90814-2236
Sugarman,Steve,Malibu,CA,90265-0923
Sethee,Jaianand,Cardiff By The Sea,CA,92007-1806
Mainland,Edward A.,Novato,CA,94949-5334

Everett,Miranda,Lake Isabella,CA,93240-0616
Tachibana,Jonathan,Los Angeles,CA,90025-5904
Rocha,Candace,Los Angeles,CA,90039-3726
Turlo,Joy,Redondo Beach,CA,90277-5811
Bassett,Christine,Sebastopol,CA,95472-5905
Nicholes,Linda,Anaheim,CA,92807-4070
O'Connell,Melanie,North Hollywood,CA,91601-4142
Welborn,Kaleo,Brea,CA,92821-7505
Sigel,Kathleen,Oak View,CA,93022-9629
Williamson,Andrea,Sebastopol,CA,95472-3628
Small,george,Venice,CA,90291-3929
Crawford,Brian,San Anselmo,CA,94960-1614
Firgens,Ronald,Pine Mountain Club,CA,93222-5123
Klug,Frank,Campbell,CA,95008-2133
Duran,Eve,San Ysidro,CA,92173-2517
Quintero,Nicole,Fullerton,CA,92831-3260
Owens,Katharine,Grass Valley,CA,95949-9296
Sokolsky,Joel,Walnut Creek,CA,94595-2310
Donahue,Linda,Shingletown,CA,96088-9578
Kafkis,Bill,Maple,CA,90210
Burtch,Steve,Marina Del Rey,CA,90292-7503
Moore,Toni,Pasadena,CA,91104-1651
Drew,Janet,Santa Rosa,CA,95403-1893
Dennis,Jonathan,Ventura,CA,93003-1058
Thryft,Ann,Boulder Creek,CA,95006-9341
Taylor,Carol,Ojai,CA,93023-3055
Lerner,Larry,Newport Beach,CA,92660-3500
Hernandez,Joshua,Los Angeles,CA,90038-1359
Herman,William,Petaluma,CA,94952-3023
Brotherton,Kate,Lake Forest,CA,92630-6630
Calcagno,Sal,Boulder Creek,CA,95006-9054
Govain-Eastman,Lauren,Oakland,CA,94606-2582
Hellman,David,San Rafael,CA,94901-1748
Buck-Moyer,Sandra,Atascadero,CA,93422-6128
Crawford,Cheryl,Pleasanton,CA,94588-3190
Green,June,Belmont,CA,94002-1812
Haseltine,Rebecca,San Francisco,CA,94110-3806
Garden,Michael,Sacramento,CA,95825-7591
Johnston,V,Auburn,CA,95603-9065
Hillier,Trisha,Beverly Hills,CA,90210
Sheffield,Flint,Sacramento,CA,95814-1469
Skwara,Alexandra,San Diego,CA,92115-6590
Snyder,Theodore C.,Granada Hills,CA,91344-1062
bradford,susan,San Rafael,CA,94901
Newlands,Joan,South Lake Tahoe,CA,96150-7961
Daniels,P.,Spring Valley,CA,91977-1123
Barlow,Laurie,San Marino,CA,91108-2842
Jardine,Peter,San Francisco,CA,94115-2512

Diaz,Olivia,Grass Valley,CA,95945-5390
Borisen,Megan,West Hollywood,CA,90069-2235
Crespi,Sonia,Oakhurst,CA,93644-9620
Korsen,Georgette,San Clemente,CA,92672-4702
Weate,John,Vista,CA,92081-6331
Ratto,Rudica,El Dorado Hls,CA,95762-6618
Boone,Joseph,San Luis Obispo,CA,93401-2606
Weeks,Marion,Novato,CA,94945-1747
Sheardy,Robert,San Francisco,CA,94109-5012
Antone,Linda,Santa Barbara,CA,93105-3174
Morton,Dennis,Santa Cruz,CA,95060-6121
Martin,Nancy,Santa Barbara,CA,93105-3500
Besecker,Tanya,North Hollywood,CA,91606-4702
Sheehan,Kitty,Thousand Oaks,CA,91362-2557
Robles,Albert,Napa,CA,94558-5220
Rhodes,Edy,Santa Cruz,CA,95063-3316
Moureau,Ann,Desert Hot Springs,CA,92240-2100
Nordine,Susan,La Verne,CA,91750-3017
Broadwater,David,Atascadero,CA,93422-3626
Berliner,Diane,Los Angeles,CA,90046-2004
Aylward,David,Redwood City,CA,94061-2773
Matlock,Kl,San Jose,CA,95112-3011
fisher,melanie,Calabasas,CA,91302-3073
Anderson,Maurica,Bridgeport,CA,93517-0155
Wyatt,Victoria,Crestline,CA,92325-3351
Everett,John,Grass Valley,CA,95945-4156
Graubner,Gabriel,Santa Rosa,CA,95404-8601
Fabiano,Donna,Forestville,CA,95436-9385
walashek,lena,Eureka,CA,95503-5470
Reed,Michele,Templeton,CA,93465-0157
Duggan,Gary,Morgan Hill,CA,95037-5247
Ota,John,Alameda,CA,94501-1509
Lilith,Ms.,Ventura,CA,93003-4929
Meyers,Robbi,Los Gatos,CA,95033-9703
Pulido,Alma,La Puente,CA,91744-3129
Felton,Chris,Auburn,CA,95602-8801
Wallin,William,Richmond,CA,94805-2413
Gross,Eileen,San Francisco,CA,94117-3223
Levy,Albert,Emeryville,CA,94608-1649
Loe,Peggy,Magalia,CA,95954-9540
Dymesich,John,Sonoma,CA,95370-8351
Thomas,Aileen,Palo Alto,CA,94303-4221
Rapp,Tera,Santa Margarita,CA,93453-0586
Bacon,Helen,San Rafael,CA,94901-1204
Gronimus,Silvia,Los Angeles,CA,90003
Larkin,Timothy,San Francisco,CA,94109-5337
Seffern II,Duncan,San Diego,CA,92109-1916
Rios,Christina,Carmichael,CA,95608-2377

Mulvey, Kevin, Oakland, CA, 94608-2708
Kern, Alicia, Palos Verdes Peninsula, CA, 90274-4034
Santos-Oyama, Rita, Long Beach, CA, 90803
McCormick, Douglas, Coto DE Caza, CA, 92679-4123
Sather, Elizabeth, Fillmore, CA, 93015-2184
Illig, David, Fair Oaks, CA, 95628-7521
Burdette, C, Los Angeles, CA, 90066-5720
De Bellis, Dominic, Benicia, CA, 94510
Gibb, Wayne, Forestville, CA, 95436-9378
Robertson, Ronald, Manhattan Beach, CA, 90266-2331
Newell, Barrie, Manhattan Beach, CA, 90266-4047
Aldsworth, Phil, Napa, CA, 94558-5007
Pisharody, Mohanan, San Jose, CA, 95124-6538
Girard, Jessica, Woodland Hills, CA, 91367-3022
Rubio, Mike, Sunland, CA, 91041-0443
Garcia, Daniela, Chula Vista, CA, 91910-3684
Bradshaw, Jacqui, Tehachapi, CA, 93581-1896
sobo, naomi, San Diego, CA, 92103-1883
Taratula, Alec, Alhambra, CA, 91801-2079
Evans, Staci, El Dorado Hills, CA, 95762-4424
Peskin, Tsipoa, Berkeley, CA, 94707-2311
Smith, Michael, Wildomar, CA, 92595-9464
Weill, Jennifer, San Pablo, CA, 94806-1161
powell, sunny, Rohnert Park, CA, 94928-2601
Hughes, Stephanie, Paradise, CA, 95967-0897
Schneider, Maria, San Diego, CA, 92128-3653
Kent, Susan, West Hills, CA, 91304-5342
Bryant, Lori, San Diego, CA, 92127-2164
Navone, Penelope, Cloverdale, CA, 95425-5420
Oh, Gael, Rio Vista, CA, 94571-0361
Villavicencio, Dennis, Three Rivers, CA, 93271-9626
Geiser, Becky, San Diego, CA, 92115-2209
Felton, Laureen, Redwood City, CA, 94062-2920
Templeton, Sara, San Francisco, CA, 94112-2459
Davis, Marisa, Los Angeles, CA, 90041-2418
Zeller, Rudy, Hercules, CA, 94547-2712
Amourgi, Piera, Pasadena, CA, 91106-4212
McNamee, Martha, Walnut Creek, CA, 94595-1367
Vollstedt, Heather, Carmichael, CA, 95608-3675
Engelsiepen, Jane, Carpinteria, CA, 93013-3077
Rainbeau-Heart, Genine, Encinitas, CA, 92024-1709
Maldonado, Gloria Linda, Redwood City, CA, 94062-2711
Fisher, Arlene, Oakland, CA, 94605-5834
Graham, Robin, San Francisco, CA, 94121-1004
Dennis, Mariankitty, Santa Cruz, CA, 95062-2651
Michelson, Golda, Fairfax, CA, 94930-1509
Wightman, Richard, Arcadia, CA, 91006-2501
C, F, Venice, CA, 90291

Peterson,Ed, Lotus, CA, 95651-9714
campo,peter, Poway, CA, 92064-4074
Frasieur,Forest, Benicia, CA, 94510-3288
Gingg,Mary, Sebastopol, CA, 95472
Madden,Don, Grass Valley, CA, 95949-9402
Sanchez,Ralph, Capitola, CA, 95010-0956
callahan,thomas, Lomita, CA, 90717-1124
Schoene,William, Santa Monica, CA, 90405-4847
Thayer,Jeff, San Diego, CA, 92117-2507
Herrlinger,Julie, Rough and Ready, CA, 95975-9714
Palmer,Allie, san clemente, CA, 92672
Fulton,Terri, Costa Mesa, CA, 92626-4326
Coakley,Michele, Rancho Cordova, CA, 95670-2517
Tribbey,Charles, San Luis Obispo, CA, 93405-4836
Green,Jamie, Ventura, CA, 93004-2884
Wianecki-Wang,Austen, Santa Ana, CA, 92706-1614
Gomez,Jacob, Salinas, CA, 93906-2225
Edman,John, Santa Clara, CA, 95051-7500
Arnold-Tuttle,Lyn, Oceanside, CA, 92054-2036
silva,krystal, San Francisco, CA, 94124-1912
Siskind,Nicole, Calabasas, CA, 91302-2247
Obrien,Lauren, Santa Monica, CA, 90403-4698
dutil,judy, Los Gatos, CA, 95033-9704
Hernandez,Steven, Long Beach, CA, 90802-3640
Schmidt,Karina, Vista, CA, 92081-8357
Rumford,Syd, Long Beach, CA, 90808-1025
owens,theresa, Eureka, CA, 95501-2757
Lyons,Margaret, Palos Verdes Peninsula, CA, 90274
Lebo,Harlan, La Mirada, CA, 90637-0614
Curtis,Kevin, Fullerton, CA, 92832-1607
Alvarez,Pauline, Orange, CA, 92867-7327
Gregory,Ramsey, Elk Grove, CA, 95758-7315
McIntosh,Ashley, Healdsburg, CA, 95448-0690
Walden,Kristin, Newbury Park, CA, 91320-3548
Brown,Laurene, Encinitas, CA, 92024-4231
Klein,Kenneth, Marina Del Rey, CA, 90292-5651
Harralson,David, Studio City, CA, 91604
Lopez,Kimberly, Maywood, CA, 90270-2313
Fujimoto,Kathy, Manhattan Beach, CA, 90266-4956
Hinkle,Phil, San Diego, CA, 92117-6557
Devine,Connie, San Jose, CA, 95138-1845
Miller,Jerome, Berkeley, CA, 94704-3317
Petry,Gabor, Oceanside, CA, 92054-5067
Ahaus,Catherine, San Jose, CA, 95125-5338
Embrey,Stephanie, Long Beach, CA, 90814-2236
Hutchinson,Melissa, Pacific Grove, CA, 93950-3146
Trivich,Mike, Sylmar, CA, 91342-5723
Goldman,Jordan, Culver City, CA, 90232-3235

Sanders, James, Perris, CA, 92570-8671
Perry, Marie, Ceres, CA, 95307-4102
Martinson, Jessica, San Juan Bautista, CA, 95045-9639
am, i, Vallejo, CA, 94591-4136
Fowler, Kim, Oakland, CA, 94619-3378
Kraft, Kevin, Menlo Park, CA, 94025-6050
Schweitzer, Eric, West Hills, CA, 91307-3525
Rosenberg, Larry, Tahoe City, CA, 96145-6902
Mayer, Todd, Soquel, CA, 95073-2648
Kaku, Michio, Carmel, CA, 93922-0554
Emberton, Hilary, Grass Valley, CA, 95945-7317
Wright, Cecelia, Coronado, CA, 92118-2971
Donaldson, Karen, Grass Valley, CA, 95945-3215
Brown, Walter, Roseville, CA, 95661-4806
NUNEZ, DAVID, visalia, CA, 93291
Zonia, S, Beverly Hills, CA, 90210
Corkey, Peter, San Francisco, CA, 94121-2810
Martinez, Sheila, Santa Maria, CA, 93455-1687
Beck, Mary, Stockton, CA, 95207-5120
Coetzee, H, La Canada, CA, 91011-2459
Apana, Patrick, Garden Grove, CA, 92841-2007
Harper, Vince, Orange, CA, 92865-1524
Gordon, Marc, Sunnyvale, CA, 94087-4054
Levine, Marci, Los Angeles, CA, 90046-1840
Trearse, Tami, Sacramento, CA, 95820-3321
Krueger, Catherine, El Cerrito, CA, 94530-4145
Patterson, Kevin, Walnut Creek, CA, 94595-2336
Beer, Julie, Palo Alto, CA, 94306-1518
Stevens, Bob, Redondo Beach, CA, 90277-2870
RUELL, DEREK, Fresno, CA, 93705-3225
Trammell, Terri, San Juan Capistrano, CA, 92675-4601
Schwartz, Don, Larkspur, CA, 94939-2321
Popoff, Kathy, San Pedro, CA, 90732-5015
lin, ed, Santa Monica, CA, 90404-3141
Demirdjian, Ana Maria, Glendale, CA, 91206-4927
Jacobs, Julie, Belvedere Tiburon, CA, 94920-2536
Walker, Stephanie, Los Altos, CA, 94022-1505
Garitty, Michael, Nevada City, CA, 95959-8515
Harmon, Pollyana, Torrance, CA, 90501-4120
"Porter, Md", Jon, Rossmoor, CA, 90720-4740
Handy, Sherry, Lincoln, CA, 95648-8336
Grenier, Celine, Capitola, CA, 95010-3511
BERRY, MARGARET A., Carmichael, CA, 95608-3426
Nagano, Karen, Napa, CA, 94558-4324
Clements, Scott, Davis, CA, 95616-2168
Montgomery, Pamela, Saratoga, CA, 95070-4409
Reedy, Kent, San Diego, CA, 92101-4251
Lenardson, Denise, Sunland, CA, 91040-1916

Iannizzotto, Deborah, Escondido, CA, 92027-3976
Klein, Renee, Marina Del Rey, CA, 90292-7026
Flores, Raquel, San Diego, CA, 92139-4002
Lunn, Teri, Petaluma, CA, 94954-1526
Healy, Dan, Green Valley Lake, CA, 92341-8454
leonard, wayne, Oak View, CA, 93022-9750
Burnham, Rita, La Crescenta, CA, 91214-3516
Dracul, Michael, Chico, CA, 95926-2380
Lee, Lawrence, Napa, CA, 94558-4235
Gardner, Renee, Costa Mesa, CA, 92627
Lowry, Jamie, Hermosa Beach, CA, 90254-4304
Manalio, Patrick, Westlake Village, CA, 91361-2070
Israni, Bina, South San Francisco, CA, 94080-7305
Goar, David, Clovis, CA, 93619-5059
Joo, Gloria, Porter Ranch, CA, 91326-3815
Byrnes, Patricia, Mill Valley, CA, 94941-3624
Haig, Brenda, Long Beach, CA, 90803
Lerose, Thomas, Mount Shasta, CA, 96067-2906
Watts-Rosenfeld, Susan, Riverside, CA, 92506-5843
Bailey, Chuck, Daly City, CA, 94015-1042
Adele, Julie, Long Beach, CA, 90814-2300
Breiding, Joan, San Francisco, CA, 94117-0625
Vodantis, Stephen, Santa Monica, CA, 90403-2973
Walters, Jennifer, Irvine, CA, 92618-0625
Consbruck, Barbara, Sylmar, CA, 91342-5150
McCafferty, Felicia, Banning, CA, 92220-6102
Perry, Karen and Allen, Yucca Valley, CA, 92284-1703
Kintz, Bruce, Idyllwild, CA, 92549-0223
Smiddy, Terra, Irvine, CA, 92606-8262
PATTON, LISA, San Francisco, CA, 94115-3234
Kraus, Andrea, West Hollywood, CA, 90069-2703
Lindey, Robert, Rancho Cordova, CA, 95670-5624
Sellers, Bonnie, Mission Viejo, CA, 92691-4327
Fishburn, Charles, Porterville, CA, 93258-0449
Hansen, Karen, Burbank, CA, 91504-3924
Gross, Anne, Modesto, CA, 95351-4920
lytle, gail, Turlock, CA, 95382-2849
Denari, Greg, Saratoga, CA, 95070-5937
Woodbury, Randall, Sebastopol, CA, 95472
Lavine, M., Portola Valley, CA, 94028-7911
Brink, Tim, STOCKTON, CA, 95203
Jensen, Victoria, Santa Monica, CA, 90405-2443
Conner, Kristen, San Pablo, CA, 94806-4058
Welts, David, San Diego, CA, 92103-4174
Burke, Tom, La Mesa, CA, 91942-2272
Aronson, Kenneth, California City, CA, 93505-4823
studer, francoise, Los Angeles, CA, 90066-9441
Cahill, Greg, Culver City, CA, 90232-3212

Voss,Cassandra,Porter Ranch,CA,91326-1027
Horton,Larry,Murphys,CA,95247-2667
Peterson,Sandra,Danville,CA,94506-6117
Leppo,Bob,Santa Maria,CA,93454-2609
Wyatt,Victoria,Crestline,CA,92325-3351
Snyder,Joanne,San Diego,CA,92123-3619
McCormick,Ryan,San Francisco,CA,94114-2078
Price,Ian,Belmont,CA,94002
Perrone,Teresa,Vacaville,CA,95687-6268
Sidhu,Asha,San Diego,CA,92116-3935
Allen,Bill,Eureka,CA,95503
Bridgeman,kim,La Selva Beach,CA,95076-1907
Bradburn,Constance,San Diego,CA,92109-3352
Overby,Karl,Fullerton,CA,92835-2211
Lashbaugh,Benjamin,Mount Shasta,CA,96067-2732
Wilkinson,Daniel,Long Beach,CA,90808-1716
Gandara-Wakin,Melissa,City of Industry,CA,91715-3471
Power,Grant,Los Angeles,CA,90026-4134
Garcia,Jeffery,Mendocino,CA,95460-1166
Rosenstein,Resa,Menifee,CA,92584-7001
Catskill,Clover,Pinole,CA,94564-2102
Quail,Karen,Davis,CA,95616-2667
Spanski,Linda,Oceanside,CA,92054-6536
hamilton,christina,Santa Monica,CA,90403-2036
Hochstetler,David,MENLO PARK,CA,94025
Steele,Jenifer,Berkeley,CA,94703-1621
Himes,Robert,W Sacramento,CA,95605-2564
O.,Jack,Laguna Beach,CA,92651-2056
Jenkins,Jeffrey,Diamond Bar,CA,91765-1256
Pierola,Antonio,Alhambra,CA,91803-3610
Lamar,Robert,Santa Cruz,CA,95060-4229
Boyd,John,North Highlands,CA,95660-6301
Ledden,Dennis,Mount Aukum,CA,95656-0004
Rice,Carolyn,Oakland,CA,94609-1024
Winegardner,Mary,Pleasanton,CA,94566-8637
Skuster,Kimberly,San Diego,CA,92122-5450
slosburg,Marsha,Sylmar,CA,91342-3327
Hearon,Sarah,Santa Barbara,CA,93130-3587
Adams,Marge,San Jose,CA,95118-2835
Brady,Roshene,Glen Ellen,CA,95442-9430
King,Jeanette,Livermore,CA,94550-3414
Hay,Alys,Windsor,CA,95492-6890
Gustafson,Robert T,National City,CA,91950-2053
Wilmoth,Charles,San Francisco,CA,94124-1017
Freidel,Dorothy,Santa Rosa,CA,95401-5356
Blackwell,Alan,San Diego,CA,92130-3196
abbey,edward,Santa Monica,CA,90401-2652
Kempf,Victoria,Escondido,CA,92026-3425

White, Roberta, Montrose, CA, 91020-1441
Wornum, Barbara, Mill Valley, CA, 94942-0834
Gobran, Fadi, Ventura, CA, 93001-2203
Blackburn, Lee, Antelope, CA, 95843-2131
Davies, Sha, Redding, CA, 96001
Chang, Stacy, Buena Park, CA, 90620-2239
Young, Kendra, San Jose, CA, 95129-3944
Schwind, Janet, Santa Cruz, CA, 95060-2438
heyn, joyce, Poway, CA, 92064-4071
Kemper, Michael, San Francisco, CA, 94109-4915
Dolgin, Gary W., Santa Monica, CA, 90402-1242
Schieding, Ann, River Pines, CA, 95675-0280
Styc, Kathleen C, Sacramento, CA, 95825-6643
Ratcliff, Charline, Walnut Creek, CA, 94596-4609
"Dillard, Jr.", Lawrence, San Francisco, CA, 94121-3835
Davis, Cheryl, Rio Linda, CA, 95673-1803
Geraci-Benson, Arlene, San Jose, CA, 95126-3616
Rodgers, Diana, Mission Viejo, CA, 92691-4231
levin, phyllis, Capitola, CA, 95010-2832
lutza, george, Valencia, CA, 91354-1598
Kaplan, Carolee, Santa Rosa, CA, 95404-4235
Whalley, Chris, Topanga, CA, 90290
Darlington, Kimble, Smith River, CA, 95567-9536
Jones, Roslyn, Riverside, CA, 92506-5365
Scanlin, Jason, Los Angeles, CA, 90008-4301
maurren, Jason, Sherman Oaks, CA, 91403-1282
Silveira, James, Modesto, CA, 95356-1908
Tedds, David, Saugus, CA, 91350-1625
turney, pat, Hayward, CA, 94542-1404
Gray, Brian, Fair Oaks, CA, 95628-3444
Zahller, Guy, Aptos, CA, 95003-4577
Vetrie, Julia, Canyon Country, CA, 91387-6318
Figu, D, Toluca Lake, CA, 91602-1206
Riley, Laura, Citrus Heights, CA, 95610-2514
Roche, David, San Francisco, CA, 94117-3104
Calderon, Linda, Oxnard, CA, 93034-2732
Swick, Chelsea, Bayside, CA, 95524-9066
Rubel, Scott, Los Angeles, CA, 90031-1633
Thorson, Trina, Westchester, CA, 90045-1122
Nesbitt, Eileen, Hesperia, CA, 92345-6065
Vartanian, Rita, Sunland, CA, 91040-2843
Vaughn, Amy, Long Beach, CA, 90801-0087
Most, Steven, Carmel Valley, CA, 93924-9335
DeSimone, Sandra, North Hollywood, CA, 91602-2058
McDonald, Stacey, Thousand Oaks, CA, 91361-5004
Burr, Barbara, Davis, CA, 95616-1906
MILTON, LARRY, Newman, CA, 95360-9665
NOURSE, JEANNE, Vineburg, CA, 95487-0429

Chadwin,Holly,Santa Barbara,CA,93110-1470
Ades,Anu,San Francisco,CA,94123-2405
Castillo,Gwen,Yorba Linda,CA,92886-5443
Mohn,Veronica,Foothill Ranch,CA,92610-1915
Heinzig,Dennis,Nicasio,CA,94946-9725
Isaac,Marian,Modesto,CA,95354-0238
Schwartzman,Liya,Sacramento,CA,95820-4232
Monsura,Victor,Garden Grove,CA,92840-1237
Barrington,Tim,San Jose,CA,95126-3273
natale,fabrizio,Belvedere Tiburon,CA,94920-2237
Coombes,Jack,Sacramento,CA,95814-4334
tyndall,steve,San Diego,CA,92111-7846
Habelski,Fabrice,Castro Valley,CA,94546-2415
Arumugham,Vinu,San Jose,CA,95132-1470
Beeler,Roxane,El Cerrito,CA,94530-2710
Rogers,Judith,Richmond,CA,94804-1273
Miller,Melissa,Pleasant Hill,CA,94523-4246
Kozlowski,Pam,Truckee,CA,96161-6908
Benzel,Karen,Carmel By The,CA,93921-5334
Wing,Martha,Oakland,CA,94618-1211
De La Mare,Russell,RSM,CA,92688
Morgan,Marilyn,San Francisco,CA,94134-1472
Meinzer,Inge,Paso Robles,CA,93447-3769
Pavlovic,Marko,Sacramento,CA,95831-3566
Fink,Martin,Beverly Hills,CA,90212-7631
Pollan,Lidice,Woodland Hills,CA,91364-5345
von Pein,Margreta,Alamo,CA,94507-2130
Martin,Barbara,Redwood City,CA,94064
Tollefson,Alan,La Verne,CA,91750-4401
Carlson,Rita,Eureka,CA,95502-3753
Hartman,Nancy,Lafayette,CA,94549-4210
Gruninger,John,Berkeley,CA,94710-2415
Russell,Michael,Santa Paula,CA,93060-1302
Goldman,Bea,West Hollywood,CA,90069-2628
Wilder,Cynthia,Rancho Palos Verdes,CA,90275-3039
Vandever,M,Santa Clara,CA,95050-6563
Crowe,Victor,Concord,CA,94518-2825
Lanew,Maryann,San Clemente,CA,92673-6520
Milton,Jack,Davis,CA,95616-3058
Jaffe,Havah,Valley Village,CA,91607-2599
Scott,Catherine,Hidden Valley Lake,CA,95467-8717
Mitchell,David,Berkeley,CA,94705-1837
Lariviere,Phil,Grass Valley,CA,95945-7124
C,F,Venice,CA,902915747
Trumbo,Debra,Orange,CA,92867-2455
Bekkar,Bruce,Del Mar,CA,92014-3218
Craig,Ella,Eureka,CA,95503-6371
Littlefield,Jim,Aptos,CA,95003-4322

Nelson,Deborah,Simi Valley,CA,93065-4217
King,Mr. & Mrs. Norman,Walnut Creek,CA,94595-3149
carmona-mancilla,laura,Ventura,CA,93001-1002
Baik,Michelle,Brea,CA,92821-5400
Cooper,Lieu,San Francisco,CA,94121-3430
Jensen,Laura,Modesto,CA,95354-0145
Harrison,Robert,Forestville,CA,95436-9694
Hillman,Linda,Camarillo,CA,93012-9418
Burk,Robert,Los Angeles,CA,90024-2544
Baxter,Linda,Yreka,CA,96097-9602
Marschner,Fred,Walnut Creek,CA,94596-3581
Clark,Malcolm,Occidental,CA,95465-0043
Fink,Christine,Stockton,CA,95207-5706
Gold,Carol,Fairfax,CA,94930-1344
Booth,Elaine,Santa Rosa,CA,95409-5807
Fairbrother,Pat,Los Angeles,CA,90034-6226
Schoble,Tiffany,Diamond Bar,CA,91765-1129
Atwood,Edward,San Francisco,CA,94103-4190
Clark,Jamie,San Francisco,CA,94108-1514
Shiels,Theresa,El Granada,CA,94019
Davenport,Cindy,Solana Beach,CA,92075-1520
Hendrix,Alice,Orangevale,CA,95662-0142
Carlson,Rick,South Lake Tahoe,CA,96150-8836
weirich,robin,Irvine,CA,92618-3349
Schick,Laurie,Beverly Hills,CA,90211-2216
Solomon,Alan,Palm Desert,CA,92261-2195
Damerell,Gina,Berkeley,CA,94703-1625
Brejla,Terry,Sonoma,CA,95370-9652
Oser,Wendy,Berkeley,CA,94702-1027
Holland,Carol,Costa Mesa,CA,92627-5430
Fernandez,Maria,San Jose,CA,95110-1610
Del Valle,Javier,Montebello,CA,90640-8360
Kelly,Pamela,Long Beach,CA,90813-3326
Van Steen,Leon,San Francisco,CA,94134-1910
Rettig,Karin,Garden Grove,CA,92845-3017
Dalition,Mitch,San Francisco,CA,94117-2279
Shulock,Damien,San Francisco,CA,94107-2957
Sifuentes,D.G.,Mammoth Lakes,CA,93546
Drummond,Maria,Apple Valley,CA,92307-4544
Salgado,Dalia,LOS ANGELES,CA,90071
Hartman,Christine,San Juan Capistrano,CA,92675-4446
Earls-Solari,Bonnie,Port Hueneme,CA,93041-1803
Smith,Makayla,Fremont,CA,94536
Raynaud,Deborah,Sebastopol,CA,95472-5249
Andersen,Stephen,San Mateo,CA,94404-2052
Doering,David,San Francisco,CA,94109-3607
Chun,Jean,Los Angeles,CA,90045-2907
Mont-Eton,Elaine,San Rafael,CA,94901-5116

Feissel, Sharon, Santa Rosa, CA, 95409-4358
Stiles, Kathy, Santa Barbara, CA, 93101-3872
Bersell, Barbara, Los Angeles, CA, 90064-3128
Berkana, Mary, Capitola, CA, 95010-2210
Florian, Brian, Beverly Hills, CA, 90211-1756
McDermitt, Evan, Fullerton, CA, 92832-1110
Oelkers, Yvonne, Visalia, CA, 93292
Comanich, Camilla, Berkeley, CA, 94707-1926
Aglia, Gary, San Marcos, CA, 92078-1043
Graff, Gail, Westlake Village, CA, 91361
Price, James, Santa Monica, CA, 90404-1767
beal, Tandy, Felton, CA, 95018-9011
Merrin, James, Thousand Oaks, CA, 91362-1601
Sage, Sandra, North Tustin, CA, 92705-3157
Gockel, Adam, Irvine, CA, 92618-0116
Geiger, Fred, Santa Cruz, CA, 95060-6433
Meza, Joel, San Francisco, CA, 94121-0144
Korson, Steven, Riverside, CA, 92503-4264
Massa, Alison, Novato, CA, 94947-7502
Franz, Amy, La Habra Heights, CA, 90631-8433
Wouk, Nina, Menlo Park, CA, 94025-4208
Berman, Nancy, Berkeley, CA, 94704-1210
Byers, Sharon, Downey, CA, 90242-4831
Stengle, Valarie, San Francisco, CA, 94112-1916
Walters, Ernie, Union City, CA, 94587-4331
Robayo, Carlos, Sydney, CA, 95306
Lanning, Kathryn, Visalia, CA, 93277-8802
Collas, Judith, Pacific Palisades, CA, 90272-4355
Letourneau, Pamela, Santa Rosa, CA, 95403-8181
Mochel, Robin, Salinas, CA, 93907-1602
Mosley, Rick, Los Angeles, CA, 90066-5292
Foti, Bernadette, Paso Robles, CA, 93446
Dawson, James, Davis, CA, 95618-6741
Rawa, Megan, Glendale, CA, 91201-4126
Morein, Aimee, Long Beach, CA, 90813-2912
Arroyo, Mima, San Leandro, CA, 94577-6201
Weisz, Russell, Santa Cruz, CA, 95060-6109
Beckham, Brice, West Hollywood, CA, 90046-5973
Bloxson, Daniel, Foster City, CA, 94404-3126
Martinez, Ruth, San Jose, CA, 95123-4101
Hicklin, Mary, Lakeside, CA, 92040
Hall, Denise, Ben Lomond, CA, 95005-0053
Seto, Wendy, Chino Hills, CA, 91709-2852
McDonnell, Robert, Westminster, CA, 92683-7844
Canning, Thomas, Calabasas, CA, 91302-2238
Mirijanian, Craig, Van Nuys, CA, 91401-4626
Porter, Susan, Pasadena, CA, 91103-1445
Johnstone, Va, Santa Barbara, CA, 93105

Weinberg, Henry, Santa Barbara, CA, 93110-2032
Roberts, Les, Fresno, CA, 93704-4335
Adams, Linda, San Rafael, CA, 94903
Burgin, Holly, Van Nuys, CA, 91405-1435
Passariello, Nina, Chico, CA, 95928-8852
Broger-Mackey, Lori, Northridge, CA, 91325-1510
Schildhaus, Arnold, Santa Barbara, CA, 93110-1392
Brandt, Kerreen, San Rafael, CA, 94903-3311
Hurwitz, Jeffrey, San Francisco, CA, 94121-2531
Lima, Larry, Campbell, CA, 95008-2903
Walsh, Catherine, Northridge, CA, 91325-2757
Piotrowski, Michael, Ramona, CA, 92065-6106
Colafranceschi, Tina, Whitethorn, CA, 95589-0201
O'Keefe, Joel, Forestville, CA, 95436
Watts, Janet, Santa Monica, CA, 90404-2415
Ruiz, George, San Carlos, CA, 94070-2220
Symcox, Geoffrey, Pacific Palisades, CA, 90272-2106
Lieb, Louise, Sebastopol, CA, 95472-6072
Dowling, Glenna, San Francisco, CA, 94115-2927
Whyman, Barbara, Ventura, CA, 93001-2064
Miller, Madge, Tustin, CA, 92780-2211
anny, anny, Thousand Oaks, CA, 91360-2066
Harlan, Rob, Mendocino, CA, 95460-9532
C, Gary, Placerville, CA, 95667
Sanderson, Michele Dawn, Walnut Creek, CA, 94595-3736
Brown, Myrna, Rosemead, CA, 91770-2028
Harris, Joseph, Sacramento, CA, 95865-5421
Beigel, Lynda, San Francisco, CA, 94117-3008
katsuda, suzy, Los Angeles, CA, 90031-1441
Taylor, Charles, El Cerrito, CA, 94530-3213
Henninger, Paul, Garberville, CA, 95542-0064
Steinfeld, Elizabeth, Santa Rosa, CA, 95401-4526
Glover, Robert, Fresno, CA, 93726-2313
cook, kathy, La Habra, CA, 90631-8918
McGinnis, Patrick, Twain Harte, CA, 95383-0647
Mayeda, Mark, Los Angeles, CA, 90056-1039
Snow, Shelley, Paso Robles, CA, 93446-2821
Hughes, Alison, San Jose, CA, 95134-1563
Kennington, Janet, Los Angeles, CA, 90077-2506
Valentine, Sarah, Saratoga, CA, 95070-5824
Sellars, Stefanie, Simi Valley, CA, 93065-4752
Gherardi, Lisa, Los Gatos, CA, 95032-5422
Darke, Jon, LA, CA, 90012-3712
Armstrong, Lynn, El Cerrito, CA, 94530-3349
Horwitz, Martin, San Francisco, CA, 94122-1608
Baxel, Gary, Cathedral City, CA, 92234
Garcia, Maria, Gardena, CA, 90247-4744
Finch, Judith, Walnut Creek, CA, 94598-1101

Bellino,Nate,San Ramon,CA,94582-5410
Morris,Alexis,San Francisco,CA,94122-2205
Chan,L.Y.,San Francisco,CA,94131-3355
Overmyer,Doris,San Rafael,CA,94903-1206
Alden,Rory,Berkeley,CA,94704-3152
Elowyn,Rebekah,Fremont,CA,94536-5904
Matthews,Dan,Valley Center,CA,92082
Wirts,John,Livermore,CA,94550-4340
Sadler,Roger,Highland,CA,92346-5843
McDonald,Stacey,Thousand Oaks,CA,91361-5004
Macan,Edward,Eureka,CA,95501-2564
Fitzpatrick,Martha,Dana Point,CA,92629-1522
Park,Jim,Los Angeles,CA,90029-8880
Gordon,Gariesue,North Hills,CA,91343-4804
Munitz,Anne,Santa Monica,CA,90402-2921
Elmendorf,Richard,Los Angeles,CA,90024-5898
Thompson,Robert,Sun Valley,CA,91352-3625
Biazevich,Michael,Rancho Palos Verdes,CA,90275-1250
byers,bette,Santa Maria,CA,93455-4182
Kloomok,Darren,Topanga,CA,90290-4333
korson,mary ann,Riverside,CA,92503-4264
Maxwell,Dan,Escondido,CA,92025-2563
Bleier,Cathy,El Cerrito,CA,94530-3205
Galdo,Querido,Oakland,CA,94601-2733
donehoo,douglas,Los Angeles,CA,90048-3659
Weaver,Judith B.,Santa Cruz,CA,95060-4945
Ortega,Sherry,Mariposa,CA,95338-8536
Ryder,James,Oakland,CA,94618-1039
Voter,Citizen,Westport,CA,95488-0113
Bruner,David,Pomona,CA,91767-2075
Nelson,Beatrice,Hayward,CA,94541-1024
escoe,shanovia 'navee',La Canada Flt,CA,91012-5231
Griswold,Wallace,Sonoma,CA,95476-0252
Lawson,Thomas,Long Beach,CA,90802-6103
An,Rose,Arcadia,CA,91006-7317
Parise,Jude,Los Angeles,CA,90046-4351
Bhence,Blaze,Cypress,CA,90630-4119
Walsh,M.,Glendale,CA,91206-2256
Blau,P,San Rafael,CA,94901-4213
Slawson,Dana,Los Angeles,CA,90019-3806
Corwin,Lynn,Fairfax,CA,94930-2212
Gowern,William,Azusa,CA,91702-6405
Boosman,William,Pacific Grove,CA,93950-2619
McLaughlin,Michael,Downey,CA,90241-4978
Niederhaus,Sharon,Portola Valley,CA,94028-8016
Kline,Thomas,Fort Bragg,CA,95437-5512
Barcellona,Nancy,Los Angeles,CA,90004-5312
Dugaw,Anne,Costa Mesa,CA,92627-3207

Christenson, Amy, Seaside, CA, 93955-5037
MacKrell, Chris, Long Beach, CA, 90813-4717
Onesti, Frances, Lawndale, CA, 90260-3404
Roth, Stephen, Santa Rosa, CA, 95409-6440
Chill, Deborah Lee, Yucaipa, CA, 92399-5374
garcia, cristina, Rancho Santa Fe, CA, 92067-4248
Zittrain, Jeff, Berkeley, CA, 94702-2464
LaFrance, Roberta, San Leandro, CA, 94579-1958
Hughes, Joe, Clearlake, CA, 95422-8837
Kelly, Deborah, Pasadena, CA, 91106-1130
Bonelli, Ricco, Redondo Beach, CA, 90277-6379
and Ariel Summerlin, Jay Atkinson, El Sobrante, CA, 94803-1627
tafel, armeda, Los Angeles, CA, 90045-2954
Ague, Kate, Menlo Park, CA, 94025-3738
Furuike, Sets, Summerland, CA, 93067
Goodwin, Karen, Chico, CA, 95926-1663
Mathur, Rachna, La Verne, CA, 91750-2042
Jordan, James, Gualala, CA, 95445-1063
Englund, Klaudia, Thousand Oaks, CA, 91360-1923
Miyashita, Charlene, Mountain View, CA, 94041
"Carr, M.D.", Donna, Encinitas, CA, 92024-2240
Berdanis, Margo, Long Beach, CA, 90807-4810
Flyer, Elizabeth, Burbank, CA, 91505-3410
Bachman, Christopher, South Pasadena, CA, 91030-4355
Krutilek, Virginia, Alameda, CA, 94501-6331
Rivard, Rhonda, Rocklin, CA, 95677-3153
Bohnet, Julie, Willits, CA, 95490-7721
Ramirez, Olivia, Castroville, CA, 95012-2645
Regalado, Geoff, Burbank, CA, 91503-4183
Giese-Zimmer, Astrid, Berkeley, CA, 94705-2424
South, James, Torrance, CA, 90505-3159
Edell, Elaine, Westlake Village, CA, 91362-4742
Tellez, Kimberlee, Los Angeles, CA, 90019-2234
Acosta, Alberto, Burbank, CA, 91505-3939
Shalit, Daniel, Wrightwood, CA, 92397
Young, Lowell, Mariposa, CA, 95338-9630
petersen, robert, Pacific Grove, CA, 93950-3410
Crawford, Art, West Point, CA, 95255-0844
Swoveland, Maury L, Mission Viejo, CA, 92691-3604
Darr, Betsy, San Francisco, CA, 94121-1216
Cortina, Cristian, Grass Valley, CA, 95945-5615
Dean, Daniel, North Hollywood, CA, 91601-1778
Benton, Todd, Bonsall, CA, 92003-3204
Baker, William, Los Angeles, CA, 90042-3523
Rodriguez, Wilfredo, Campbell, CA, 95008-6266
Kossoff, Laurie, El Cerrito, CA, 94530-3704
Moser, Blair, San Francisco, CA, 94110-2928
gertz, michael, San Francisco, CA, 94117-1562

Kandisetty, Satish, Sacramento, CA, 95829-9573
Sherman, David, Santa Rosa, CA, 95405-8116
McGrane, Dan, Pleasanton, CA, 94566-1135
De Nijs, Sacha, Huntington Beach, CA, 92647-6618
Watson, David, Monte Rio, CA, 95462-0281
Behl, Heike, San Diego, CA, 92109-3696
Daves, Claylon, Oceanside, CA, 92057-8105
Dahill, Lisa, Thousand Oaks, CA, 91360-2674
Fuller, Tony, Petaluma, CA, 94954-9552
Mcdonald, Pamela, Riverside, CA, 92505-2221
MacDougall, Caroline, Santa Barbara, CA, 93105-2347
Evans, Jacquelyn, Berkeley, CA, 94708-1204
Schumacher, Brandy, Citrus Heights, CA, 95610-2514
Witucki, Edward, Porter Ranch, CA, 91326-2231
Hayes, Jennifer, Modesto, CA, 95350-1716
Wayland, Sean, Rohnert Park, CA, 94928-1879
Gyatso, Lama-Jigme, Burbank, CA, 91505-3298
Heske, Amanda, Fullerton, CA, 92833-1262
Seratti, Donald & Rosanne, San Jose, CA, 95128-4116
Mikels, Brett, Granada Hills, CA, 91344-5126
Ramstrom, Eric, Redding, CA, 96002-5125
Fleming, Doris, Aptos, CA, 95003-5821
Begg, James, Truckee, CA, 96161-2154
Simpson, Errol, Walnut Creek, CA, 94597-2118
Woods, Jorden, Saratoga, CA, 95070-6041
Menendez, Daniella, Santa Cruz, CA, 95060-2611
Rye, Faye, Torrance, CA, 90505-5445
Nolan, Carolyn, Fresno, CA, 93704-2363
Fish, Margaret, Boonville, CA, 95415-0533
Hack, Todd, Chula Vista, CA, 91913-8354
Watts, Barbara, Los Alamos, CA, 93440-0052
Quimby, Pat, Los Angeles, CA, 90016-1245
Hicks, Brian, Oakland, CA, 94602-1303
Eaton, Chris, Tujunga, CA, 91042-1836
Rossi-Pearl, Diane, South San Francisco, CA, 94080-2656
Connolly, James, Chico, CA, 95926-9658
Jorgensen, Alena, Temple City, CA, 91780-2235
Lubin, Diana, La Mesa, CA, 91941-7121
Hertz, Richard, San Diego, CA, 92117-3704
Schubert, Keith, Long Beach, CA, 90804-1510
Lusk Zuerlein, Melinda, Carlsbad, CA, 92008-2510
Davis, Miriam, Caspar, CA, 95420-0115
Harper, Rebecca, Los Angeles, CA, 90049-1220
Stahl, Christopher, Sunnyvale, CA, 94086-6648
pucci, Stephen, Richmond, CA, 94804-7478
Robinson, Nancy, Ridgecrest, CA, 93555-3947
McCleskey, Dean, Santa Ana, CA, 92706-1937
Jennings, Beverly, Santa Cruz, CA, 95060-3646

Smith, Yvonne, Upland, CA, 91784-1703
Mills, John, Hesperia, CA, 92345-2914
Chang, Leah, Van Nuys, CA, 91405-2667
Klier, Alyson, Oceanside, CA, 92054
Crist-Whitzel, Janet, Half Moon Bay, CA, 94019-1406
Mason, Scott, Tarzana, CA, 91356-1326
Steele, Mary, Laguna Niguel, CA, 92677-2104
Tidwell, Amber, Los Angeles, CA, 90068-3005
Ahlgren, Dana, Rancho Cordova, CA, 95670-2867
Daspit, Nicole, Sebastopol, CA, 95472-2460
Jackson, Cynthia, Pleasanton, CA, 94566-8610
Johnson, Tina, Garden Grove, CA, 92845-1538
Pinneau, Janet, Los Angeles, CA, 91325-2822
Barmore, Matt, San Diego, CA, 92109-3752
Dugaw, Anne, Costa Mesa, CA, 92627-3207
Spencer, Amy, Grass Valley, CA, 95949-9041
Gordon, Kathleen, Dana Point, CA, 92629-2437
Bender, Gerald, Santa Rosa, CA, 95409-3858
Mustafa, Ibrahim, San Francisco, CA, 94109-3479
Peterson, Sandra and Roger, Santa Rosa, CA, 95401-6084
Schader, Kevin, Walnut Creek, CA, 94597-1871
Edmonds, Teresa, Carmel Valley, CA, 93924-9755
Montagne, JP, San Diego, CA, 92105-2930
Griswold, Dean, Fair Oaks, CA, 95628-2929
Shelton, Carole, Los Angeles, CA, 90035-4311
Jacecko, Kathleen, Redondo Beach, CA, 90278-2827
George, Catherine, Napa, CA, 94559-4464
Dunn, Sherry, Penn Valley, CA, 95946-8953
Whetstine, Linda, Poway, CA, 92064-3714
Rubalcava, Azucena, Los Angeles, CA, 90066-4591
LaBerge, Paul, Oakland, CA, 94608-3164
Araujo, Jocelyn, Winters, CA, 95694-1704
Tormos, Winston, Apple Valley, CA, 92308-5876
Josephs, William, Los Angeles, CA, 90046-1619
Kerridge, Kathy, Benicia, CA, 94510-2524
DeGoeas, Chris, Cerritos, CA, 90703-2306
Lorber, Caro, Kelseyville, CA, 95451-8923
Chatlosh, Mike, Menifee, CA, 92584-7669
Garcia, Evette, Hawaiian Gardens, CA, 90716-2310
Roman, Nora, San Francisco, CA, 94110-5913
Winter, Kimberly, Riverside, CA, 92509-6841
Oster, Seth, Ventura, CA, 93003-1335
Edmonston, Pandora, Mariposa, CA, 95338-8701
Carrigan, Milton, San Luis Obispo, CA, 93401-5501
Rogers, Matthew, San Francisco, CA, 94110-3433
Schlobohm, Pamela, Santa Monica, CA, 90403-5029
Seaton, Chris, Santa Barbara, CA, 93101-4651
Rad, Shahin, Laguna Niguel, CA, 92607-6573

Hanger, Lee, Rocklin, CA, 95765-4629
Forrest, Katherine, Mountain View, CA, 94041-2247
maynard, catalina, San Diego, CA, 92139-3103
Brown, Erica, San Andreas, CA, 95249-9499
Berling, Kristen, Fremont, CA, 94536-3945
Brown, Vera, Redwood City, CA, 94065-1338
franklyn, rex, Tiburon, CA, 94920-1325
Herringshaw, Janet, Pescadero, CA, 94060-0823
Griffy, Kathleen, Monrovia, CA, 91016-4731
Appelmans, Claire, Santa Cruz, CA, 95060-2415
Culbreath, Tami, Creston, CA, 93432-9703
Rinaldo, Giuliana, Burlingame, CA, 94010-5355
Gentry, H Clarke, Oakland, CA, 94609-1346
Schnyder, Karlee, San Marcos, CA, 92078-7106
Porter, Joelle, Susanville, CA, 96130-1530
Everett, Karla, San Jose, CA, 95136-3944
Head, Kathleen, Murrieta, CA, 92562-3525
Wedemeyer, Robert, Palo Alto, CA, 94301-2906
Hipol, Jay-R, San Jose, CA, 95127-1858
Farm Animal Compassionate Engagement, Stephen, Culver City, CA, 90230-3733
Cosgrave, Sean, Victoria, CA, 23400
Paccini, Rosemarie, San Diego, CA, 92154-3919
Ashley, Kate, Redwood City, CA, 94061-3242
Turvey, Kevin, Long Beach, CA, 90815-2301
Waters, Anje', Grass Valley, CA, 95945-7804
Gotch, Dan, Pacific Grove, CA, 93950-5305
Lindh, Carrie, Richmond, CA, 94805-1610
Aker, Katherine, Tujunga, CA, 91042-1816
Rosas, Greg, Castro Valley, CA, 94546-3653
Ezekiel, Joshua, Salinas, CA, 93901-1316
martin, maureen, Fort Bragg, CA, 95437-5012
Fowler, Patricia, Oceanside, CA, 92056-5130
Karlen, Eva, Mill Valley, CA, 94941-1742
Smith, Sara, San Luis Obispo, CA, 93401-2621
Wright, Katherine, Aliso Viejo, CA, 92656-1478
Kosup, Kyle, Albany, CA, 94706-2108
Pimentel, Gisela, San Pedro, CA, 90731-3014
SONODA, CHARLOTTE, Berkeley, CA, 94709-2022
Eyre, Janet, San Francisco, CA, 94118-1323
Moreno, Traci, Lancaster, CA, 93536-8377
Nelson, Beth, Costa Mesa, CA, 92626-2360
Mcclure, Lyn, Placerville, CA, 95667-9144
Schlesinger, William, Los Angeles, CA, 90046-6810
House, Michael, Redwood City, CA, 94061-3543
Yount, Anne, Mendocino, CA, 95460-9586
Kaplan, Cheryl, Los Banos, CA, 93635-3514
Wayne, Susan, Loma Linda, CA, 92354
Palomino, Patrick, Hawthorne, CA, 90250-3506

Gurney,Brian,San Jose,CA,95139-1201
Souza,Stan,Santa Rosa,CA,95409-5625
Jacques,Karen,Sacramento,CA,95811-7105
Klepadlo,Vickie,Oxnard,CA,93035-2728
Jenkins,Jeffrey,Diamond Bar,CA,91765-1256
Biggs,Tiffany,South Lake Tahoe,CA,96158-1953
Tomola,Vicki,San Francisco,CA,94116-1651
Nichelson,Larry,San Francisco,CA,94109-1660
Rees,James,Castro Valley,CA,94546-4517
Crawford,Helen,Nevada City,CA,95959-2922
Aharonian,Natalie,North Hollywood,CA,91605-3944
Bonn,Ernestine,San Diego,CA,92116-4039
Hammer,F,San Francisco,CA,94123-3159
spence,kathy,Moraga,CA,94556-2310
Mello,Gilberto,Los Angeles,CA,90068-2016
Bernath,Emily,Ventura,CA,93003-4815
Frank De Haan, Frank,Sun Valley,CA,91352-2732
Perdios,Dan,Palm Springs,CA,92262-0701
Ingham,Ames,Los Angeles,CA,90039-3505
Ries,Julie,Topanga,CA,90290-4410
Keniston,Stanley,San Diego,CA,92116-1929
Thibodeau,Dave,Corte Madera,CA,94925-2034
Genasci,Elaine,San Luis Obispo,CA,93401-6710
Gordon,Carol,Los Angeles,CA,90027-1118
John,Rosalind,Irvine,CA,92602-0773
Holland,Lynn,Burbank,CA,91505-2997
Strassberg,Rich,Los Angeles,CA,90034-7002
Camhi,Lynn,Petaluma,CA,94952-6446
Weiske,Lynne,Los Angeles,CA,90048-5106
Dosaj,Soraya,Valley Glen,CA,91401-2429
Symonds,Russell,Costa Mesa,CA,92627-2268
Leong,Roland,Pleasant Hill,CA,94523-4235
Parzick,Anne,Corona Del Mar,CA,92625-1324
Trask,Jamie,Mission Viejo,CA,92691-6131
moser,joyce,Laguna Woods,CA,92637-6708
Java,Emma,La Mesa,CA,91941
Long,Loretta,Napa,CA,94558-5579
Poland,Mark,Palmdale,CA,93550-7703
De Bellis,Dominic,Benicia,CA,94510
Broemser,Patricia,Sunnyvale,CA,94087-3138
Hall,Noah,Long Beach,CA,90805-5917
Wilson,Signe,Santa Barbara,CA,93121-2251
Royer,Allen,San Jose,CA,95125-3114
Ritenour,Helen,Porter Ranch,CA,91326-1632
Benham,Laurie,San Diego,CA,92110-5124
Moon,Brandon,San Diego,CA,92122-2625
Hansen,Christopher,Burbank,CA,91507-2010
Hendrick,Karyl,Fairfield,CA,94534-2954

Boyer, David, Palo Alto, CA, 94304-2418
Miller, Helen, Van Nuys, CA, 91401-2115
Morales, Laura, San Ysidro, CA, 92173-2444
Able, Mary, McArthur, CA, 96056-7633
Kiceniuk, Taras, Santa Paula, CA, 93060-1328
Mendoza, Salvador, Gustine, CA, 95322-1363
Donnelly, Devin, Fairfield, CA, 94535
Tilton, Mary, Capistrano Beach, CA, 92624-1233
Andazola, Salvador, Norwalk, CA, 90650-6010
Massery, Richard, Walnut Creek, CA, 94597-2955
Guillot, Bernard, Redwood City, CA, 94062-1743
Alvarez, Shirley, Los Angeles, CA, 90006-4421
Sterling, Kaylah, Emeryville, CA, 94608-3577
Hughes, Kathryn, Moreno Valley, CA, 92555-3114
Ciaramitaro, Ann Annette, Santa Cruz, CA, 95060
Wallace, Guy, Los Osos, CA, 93402-4005
Kerbyson, Gerry, Los Gatos, CA, 95032-1642
Threadgill, Michael, Winchester, CA, 92596-0722
T, Elizabeth, San Jose, CA, 95132-2618
Berman, Juliann, Redwood City, CA, 94061-4228
Golter, Lindsay, Laguna Niguel, CA, 92677-1857
Sloan, Gayl, Vacaville, CA, 95688-4338
Gladfelter, Barbara, Dixon, CA, 95620-3627
Sketo, Steve, Bakersfield, CA, 93312-5144
McCombs, J E, Point Arena, CA, 95468-9402
Holden, Cathy, Sacramento, CA, 95865-4733
Schindele, Paulette, San Marcos, CA, 92069-7501
Krupinski, K, Los Angeles, CA, 90042-1348
Turrentine, Rogers, Oceanside, CA, 92054-3271
Wingfield, Isaac, Santa Rosa, CA, 95403-1948
naughton, Charleene, North Highlands, CA, 95660-2902
Weiss, Arleen, San Leandro, CA, 94578-1414
Lyons, Jeremy, West Hollywood, CA, 90046-5934
Goldinger, Lyn, Culver City, CA, 90230-4933
richards, Steven, N, CA, 94538-3986
Lynch, Michael, Oakland, CA, 94605-2230
Moreland, Ethan, Rancho Cucamonga, CA, 91730-3659
Sheffield, Shirley, Oakland, CA, 94601-2007
Blatter, David, Suisun City, CA, 94585-2523
Lawton, Kathleen, Sonoma, CA, 95476-5977
A, M, Sunnyvale, CA, 94086-6774
Ballard, Jill, Solvang, CA, 93463-3751
Sutherland, Hugh, Goleta, CA, 93117-8003
Ritter, Phil, Sausalito, CA, 94965-2920
Silan, Sheila, Somerset, CA, 95684-9280
Fine, Lena, Campbell, CA, 95008-3536
Seeley, Marsha, San Francisco, CA, 94109-6517
Hoff, Marsha, Stockton, CA, 95204-4107

McRae, Frank, Los Angeles, CA, 90010-1805
Hansen, Jan, Somerset, CA, 95684-9547
Rauschenberg, Dan, Desert Hot Springs, CA, 92240-1441
schadt, amy, Los Angeles, CA, 90042-2359
Kinar, Kathy, Camarillo, CA, 93012-9432
Boyer, Richard, San Clemente, CA, 92673-3242
Cook, Steven, Big Bear Lake, CA, 92315-3037
Crites, Marla, Chico, CA, 95928-9103
Spencer, Jeremy, Pacifica, CA, 94044-3318
Durstensfeld, Albert, Glendale, CA, 91214-3722
Chatterji, Mona, Fairfax, CA, 94978-0051
Alden, Rory, Berkeley, CA, 94704-3130
Smith, Dana, Ventura, CA, 93001-2464
Groome, Malcolm, Topanga, CA, 90290-3353
Elliott, Gretchen, San Francisco, CA, 94127-2801
Moore, Eric, Pismo Beach, CA, 93448-1137
Ananthakrishnan, Heidi, Santa Monica, CA, 90403-5603
Emmert, Darlene, Capitola, CA, 95010-2051
Glasser, Nedra, San Diego, CA, 92130
O'Hara, Gayle, Sonoma, CA, 95476-8331
Olson, Leah, San Francisco, CA, 94104-4215
Prescott, John, San Francisco, CA, 94102-3200
cavette, catherine, Berkeley, CA, 94709-2021
Reola, Matthew, San Clemente, CA, 92672-6624
rocha, laura, Sacramento, CA, 95820-3900
Reifer, Jane, Fullerton, CA, 92832-1417
Galaif, Martha and Richard, Pacific Palisades, CA, 90272-2603
Evans, Colleen, Sacramento, CA, 95818-3323
Holland, Deborah, Temecula, CA, 92592-7701
Robinson, Rebecca, San Pablo, CA, 94806-1568
Bateman, Abby, San Diego, CA, 92106-1518
S., Jamie, San Francisco, CA, 94121
Salerno, Suzanne, Temple City, CA, 91780-3829
leonard, c, San Bernardino, CA, 92404-2919
Gregg, John, Santa Cruz, CA, 95062-3506
Bein, Keith, Oakland, CA, 94602-4039
Keck, Carolyn, San Jose, CA, 95112-3442
Hennessy, Peter, Arcata, CA, 95521-6842
English, Cheryn, Santa Barbara, CA, 93109-1327
Edwards, Estella, Walnut Creek, CA, 94598-3502
Welch, Paul, San Jose, CA, 95118-3902
Jones, Robert M., Rancho Cucamonga, CA, 91730-2864
LUVIANO, SABRINA, Stockton, CA, 95267-0781
Rodriguez, Doris, Lake Forest, CA, 92630-7245
Tomsky, Andy, San Marcos, CA, 92079-0683
Jung, Calvin, Burbank, CA, 91505-3450
K, T, Los Angeles, CA, 90041-1333
Danese, Barbara, Placerville, CA, 95667-5601

Manson,Tim,Los Angeles,CA,90066-6274
Guerrero,Desiree,Corona,CA,92882-4533
Atwood,Bob,"Redding,Ca",CA,96003
Day,Margaret,Sonora,CA,95370-5047
Pearson,David,San Diego,CA,92128-5113
McMahan,Pamela,Oceanside,CA,92057-5710
conklin,jim,Stockton,CA,95219-3218
Wanamaker,Abby,Woodland Hills,CA,91364-2935
Nevin,Debra,Danville,CA,94526-2825
Wagovich,Kenneth,Cathedral City,CA,92234-4843
Daly,John,San Clemente,CA,92672-4353
Harman,Susan,Oakland,CA,94619-2206
Haines,Shauna,Berkeley,CA,94703-1266
Peterson,Nancy,Scotts Valley,CA,95066-3627
Cabot,Kimberly,Arcata,CA,95521-5543
McBride,Ellen,Rocklin,CA,95765-4287
Reback,Mark,Los Angeles,CA,90042-1107
LINTZ,MICHAEL,Los Angeles,CA,90046-4234
Rajcic,Debbie,Riverside,CA,92503-6111
Heaphy,Nicolette,San Francisco,CA,94122-1223
Leath,Jan,Glendale,CA,91205-3629
Gray,Jim,Hemet,CA,92544-7344
Wilkins,Paul,Glendale,CA,91203-1356
Aladeen,Donna,San Mateo,CA,94402-2907
Karsh,Michael,Martinez,CA,94553-3576
Verga,Enrico,Seal Beach,CA,90740-6473
Polish,Bret,Los Angeles,CA,90034-5075
Hill,A,Big Bear Lake,CA,92315-7138
Cappa,Karen,Rohnert Park,CA,94928-5002
Holmes,Juliet,Roseville,CA,95747-6768
Anderson,Pamela,Campbell,CA,95008-3002
Alet,Frances,Calabasas,CA,91302-3408
Watts,Elizabeth,Richmond,CA,94804-5236
Smith,Susan,Los Angeles,CA,90027-3809
Cerrillo,Fred,Glendale,CA,91208-2025
Nelson,Paul,Twain Harte,CA,95383-0872
Strauss,Linda,El Sobrante,CA,94803-2502
Martin,Ben,Mountain View,CA,94040-1483
Blatt,Joel,Mountain View,CA,94043-2849
Ulring,Karen,San Francisco,CA,94117-2319
Colindres,Anthony E,Daly City,CA,94015-3266
Damon,Rhea,Calabasas,CA,91302-1966
Hams,Stephen,Los Altos,CA,94022-2220
Borbon,Melissa,Los Banos,CA,93635-2905
Knowland,Diana,Rosamond,CA,93560-6040
Simental,Smiley,Rialto,CA,92376-7241
Arterburn,Eileen,Escondido,CA,92025-4313
Bracken,Kyle,Los Angeles,CA,90066-6451

Kasman, Deborah, Azusa, CA, 91702-6817
Crawford, Kathleen, Walnut Creek, CA, 94595-1123
Pallanes, Beatriz, Santa Ana, CA, 92704-3131
Wiley, Charles, North Hollywood, CA, 91606-3934
Langley, Jane, Pacific Palisades, CA, 90272-4025
Liechty, Alan, Los Altos, CA, 94024-4909
Rodriguez, Macrina, Sacramento, CA, 95835-2059
Deatherage, Ashley, Bakersfield, CA, 93306-2925
McConnell, Molly, San Diego, CA, 92116-2237
Poage, Jan, Santa Cruz, CA, 95060-4122
Newick, Kurt, Campbell, CA, 95008-3739
Keller, Vivian, Red Bluff, CA, 96080-8331
Dunst, Christian, Toluca Lake, CA, 91602-2924
Yazdi, Teri, San Carlos, CA, 94070-2812
Gilbert, Tracy, Rialto, CA, 92377-8831
Bianco, Dina, Seal Beach, CA, 90740-6158
Gardiner, Rick, Paradise, CA, 95969-2707
Canes, Candice, San Diego, CA, 92154-2365
Bazinet, Jon, San Lorenzo, CA, 94580-2444
Yamaguchi, David, Fresno, CA, 93704-1850
krulevitch, karen, Carpinteria, CA, 93013-1206
Berman, Leah, Aptos, CA, 95003-3305
Collier, Fran, San Francisco, CA, 94133-2218
Christiansen, Janis, Menlo Park, CA, 94025-5817
Caliandro, Christine, Santa Rosa, CA, 95404-6825
Washington, Martin, Berkeley, CA, 94702-1811
Lewis-Gunning, Sylvia, Thousand Oaks, CA, 91320-4111
johnson, arnold, Los Angeles, CA, 90017-1908
Feldman, Tom, La Canada Flintridge, CA, 91011-2020
Schlitz, Barbara, Belmont, CA, 94002-3714
Massery, Richard and Vivien, Walnut Creek, CA, 94597-2955
De Cecco, Jose, San Francisco, CA, 94114-1105
brown, sydney, Tracy, CA, 95376-3334
Sharron, Julie, Los Angeles, CA, 90064-2109
Shreve, Rick, Weott, CA, 95571-0011
Knoll, Carolyn, Orinda, CA, 94563-3703
Rice, Ann, Fremont, CA, 94536-2925
Birmingham, Jim, Volcano, CA, 95689-0440
Yu, Jane, Granada Hills, CA, 91344-2226
Olson, Megan, Los Angeles, CA, 90027-4933
Snively, Margaret, Morgan Hill, CA, 95037-6032
Henderson, Scott, Los Angeles, CA, 90066-2235
Winkler, Mark, Ukiah, CA, 95482-6604
Albert, Cheryl, Freedom, CA, 95019-2708
Gore, Robert, Los Gatos, CA, 95032-2516
Carter, Marian, West Covina, CA, 91791-1937
Cochran, Jean G., Pomona, CA, 91767-2075
Salvo, Dennis, Lafayette, CA, 94549-1702

Douglas,Graham,Brisbane,CA,94005-1302
Albert,Barbara,San Francisco,CA,94117-2969
Mackay,Donald,South Pasadena,CA,91031-0823
Smith,Tom,Oakhurst,CA,93644-8757
Sasaki,Wynn,Scotts Valley,CA,95066-3914
Genetti Reinhard,Cathy,La Selva Beach,CA,95076-1629
Khalsa,Mha Atma S,Los Angeles,CA,90035-3314
Herrera,Maria,Palmdale,CA,93550-6921
Duggan,Eric,West Sacramento,CA,95691-5967
martinez,c.,San Diego,CA,92104-1370
Goodwin,Elizabeth,Los Angeles,CA,90068-3928
Chapek,S.,San Francisco,CA,94118-2520
Patyk,Stacy,Aptos,CA,95003-4518
decorte,lisa,Fontana,CA,92336-5810
Payne,Bonnie,Los Gatos,CA,95032-6478
Hunter,Benjamin,Sacramento,CA,95834-1053
Remy,Deborah,Carmel Valley,CA,93924-8902
kuljerich,kevin,mammoth lakes,CA,93546
Strailey,Faith,Quincy,CA,95971-3012
G Heinle,Janet,Santa Monica,CA,90403-4066
Garrecht,Jamila,Petaluma,CA,94952-4157
Fuentes,Luis,Palm Springs,CA,92262-2390
Crabb,Jeanne,Fremont,CA,94536-2412
Carmichael,Maria,West Covina,CA,91791-3218
Johnson,Robert,El Segundo,CA,90245-3259
Greenberg,Bert,San Jose,CA,95135-1428
Walters,Ivonne,Redlands,CA,92374-6259
Powell,Kathleen,Vallejo,CA,94590-3943
Fong,Christianne,Whittier,CA,90603-3212
Yuen,Nancy,San Diego,CA,92126-3867
Benda,Hilarey,Los Angeles,CA,90035-1418
Keay,Pete,Pleasant Hill,CA,94523-5508
Carman,Andy,Santa Cruz,CA,95060-6335
Smith,Nancy,San Diego,CA,92106-2743
Muhar,Jana Mariposa,Santa Rosa,CA,95401-5539
Mc Entee,Janet,San Jose,CA,95128-3680
Bruce,Linda,Yuba City,CA,95993-5608
Wieland,Leslie,Willits,CA,95490-3556
zolan,frieda,San Rafael,CA,94903-1129
Rosen,Natalie,Woodland Hills,CA,91364-3529
Lamb,Barbara,Oakland,CA,94610-3365
Francis,Victoria,Los Angeles,CA,90031-1620
Sebastian-Lewis,Ms. Harley,Sacramento,CA,95823-3043
Kwiatkowski,Jane,Pittsburg,CA,94565-3628
Mackenzie,Anna,Santa Monica,CA,90405-5015
Boyce,Janice,Berkeley,CA,94707-1621
Chan,B.,San Diego,CA,92131-2430
Kocel,Mason,Oceanside,CA,92057-1835

Landi,Dennis,Long Beach,CA,90813-4027
Chase,Cheryl,Stockton,CA,95210-2526
Blood,Lawrence,Santa Cruz,CA,95060-5808
Decargouet,Yves,Lucerne,CA,95458-8502
Miller,Steven,Lakeside,CA,92040-2503
Wallace,Melanie,Sacramento,CA,95816-7114
Cahill,Bryan,Los Angeles,CA,90034-5517
Ross,Elizabeth,San Leandro,CA,94577-2135
Krizan,Kim,Los Angeles,CA,90065-1952
Drury,Bob,Long Beach,CA,90814-3014
Childers,Deborah,Modesto,CA,95350-0625
Bocek,Christina,Santa Barbara,CA,93103-2215
Winehouse,Jordan,San Francisco,CA,94117-1208
Lind,Carol Anna,San Francisco,CA,94117-4460
Wills,Marilyn,Los Osos,CA,93402-2304
Ford,Deborah,Woodland,CA,95776-0056
Deem,Janice,Mill Valley,CA,94941
Harley,Janet,Tahoe Vista,CA,96148
Chan,Karl,Littlerock,CA,93543-2309
Rossi,Thomas,Sun Valley,CA,91352-1918
Mori,Reyko,Glendale,CA,91207-1526
Kass,Bronte,Los Gatos,CA,95030-7503
Johnston,Don,Davis,CA,95618-4418
Gregory,Probyn,Tujunga,CA,91042-1449
Ostrow,Hillary,Encino,CA,91316-1013
Black,Chanelle,Huntington Beach,CA,92648-5947
DeRose,Sonja,Foresthill,CA,95631-0279
Milkoff,Ted,Santa Rosa,CA,95404-1306
Greif,Jeff,Venice,CA,90291-3871
Zack,W.J.,San Francisco,CA,94114-3180
Cherry,Jason,San Francisco,CA,94103-2769
Garcia,Kate,Sacramento,CA,95825-6607
Barrows,Patrick,San Diego,CA,92106-2814
Demiralp,Aydan,Irvine,CA,92612-1728
Cardella,Richard,Hydesville,CA,95547-9416
Atwell,J.,Burbank,CA,91506-1913
phenix,Lisa,Carmichael,CA,95608-6250
Carey,Peter,Ridgecrest,CA,93555
Shea,Alexander,Los Angeles,CA,90028-7554
Phillips,E. Lehuanani,Santa Clarita,CA,91321-2673
valeri,marian,San Diego,CA,92123-3436
Cafiero,Mimi,Felton,CA,95018-9709
Cruger,Kurt,Long Beach,CA,90803-5416
Leroy,Amy,Santa Rosa,CA,95403-2913
Bazinet,Jon,San Lorenzo,CA,94580-2444
Yocum Haller,Maryann,Escondido,CA,92025-5672
Raymond,Bruce,Oceanside,CA,92054-2409
Chu,Jonathan,Fremont,CA,94539-4440

Scott, Marilyn, Santa Barbara, CA, 93110-1323
Cossettini, Lisa, Playa Del Rey, CA, 90293-8007
W., Ryan, Fontana, CA, 92336-0148
Gray, Jayne, Laguna Woods, CA, 92637-0700
Pharr, Merianne, Fremont, CA, 94536-4490
Coots, Jim, Long Beach, CA, 90815-2434
Edmondson, Rick, Danville, CA, 94526-3934
uschyk, carol, Calistoga, CA, 94515-1122
Fite, Austin, Pacific Plsds, CA, 90272-1961
Wheat, Amber, Redondo Beach, CA, 90278-2937
Krum, Jill, Huntington Beach, CA, 92646-4430
Ann, Tina, Bolinas, CA, 94924-0265
Hager, Brenda, Thousand Oaks, CA, 91360-4742
Perkins, James, Los Angeles, CA, 90037-4029
tashiro, terance, Los Angeles, CA, 90045-2751
Sepulveda, Chrissy, Anaheim, CA, 92802-4778
Korzuchin, Alexey, Dublin, CA, 94568-1050
Tomczyszyn, Michael, San Francisco, CA, 94132-3140
Maharaj, Ruvita, Richmond, CA, 94805-1105
Running, Sandra, Whittier, CA, 90604-1265
Fishtein, Patricia, San Diego, CA, 92105-3548
Schmidt, Debbie, Lancaster, CA, 93536-4202
Harrison, Jennifer, Larkspur, CA, 94939-1305
Turner, Kim, Petaluma, CA, 94954-3905
jones, thomas, Berkeley, CA, 94708-1549
Duszynski, Derek, Los Angeles, CA, 90049-3554
DiCarlo, Leigh Ann, Winchester, CA, 92596-8506
Zabko, Valerie, Novato, CA, 94947-3709
Barba, Patricia, Los Angeles, CA, 90026-5374
Perez, Carlos, Chula Vista, CA, 91915-1652
Colby, Benjamin, Valley Ford, CA, 94972-0466
Head, Margret, San Jose, CA, 95117-1653
Heck, Nancy, Santa Maria, CA, 93454-6648
Suzuki, T, Long Beach, CA, 90810-4123
Stewart, Karen, San Jose, CA, 95120-1781
Burnham, Jan, Sacramento, CA, 95822-2814
Jensen, Julianne, Daly City, CA, 94014-3450
Bender, Kae, Lancaster, CA, 93536-4827
Principe, Peter, San Marcos, CA, 92079-1044
Ayala, Joe, Simi Valley, CA, 93063-2901
Lebas, Anne, San Rafael, CA, 94903-2571
Gainer, Jane, Wildomar, CA, 92595-7976
Shelton, Donna, Murrieta, CA, 92562-4313
Hendricks, Leslie, San Francisco, CA, 94122-1928
Connor, Arthur, Idyllwild, CA, 92549-3317
Weiss, Norman, Santa Cruz, CA, 95060-3006
Warren, Victoria, Clovis, CA, 93612-0965
Navarro, Allison, San Juan Bautista, CA, 95045-0386

Podsakoff,David,Long Beach,CA,90802-3878
Morse,Paul,Walnut Creek,CA,94595-1261
Quinn,Tracey,Boulder Creek,CA,95006-9358
Thomas,Shakayla,Compton,CA,90220-2645
Vogel,Nathan,San Francisco,CA,94117-3110
Pendleton,Elizabeth,Grass Valley,CA,95945-8804
Wieland,Chuck,San Ramon,CA,94583-1683
martinez,john,Lomita,CA,90717-1514
Paul,Lesley,Harbor City,CA,90710-2648
Weinstein,Christine,San Diego,CA,92111
Shepherd,Marilyn,Trinidad,CA,95570-0715
Sayre,Debbie,Fremont,CA,94536-5277
Wolf,Carol,Encinitas,CA,92024-4439
England,Bruce,Mountain View,CA,94043-5255
Hofman,Andrew and Geraldine,Valley Village,CA,91601-4359
Allen,Dennis,Santa Barbara,CA,93105-2138
Carrier,Paula,San Diego,CA,92101
Taaff,Barbara,Chatsworth,CA,91311-2064
Chang,Gabriel,Bellflower,CA,90706-5325
Arizpe,K,Livermore,CA,94550-6357
Mayer,Karen,Eureka,CA,95503-9776
Raimo,Joan,Montrose,CA,91020-1626
Toor,Manmeet,Los Angeles,CA,90024-3000
Bristow,Cynthia,Placentia,CA,92870-5512
Davis,Susan,Los Angeles,CA,90027-4635
Exton,Jack,Roseville,CA,95678-9999
Pratt,Robert,Oak Park,CA,91377-3724
Meier,Elsbeth,Rodeo,CA,94572-1330
Ramsay,Colin,Sebastopol,CA,95472-3736
Knight,Elizabeth,Santa Rosa,CA,95401-5355
Karlinski,Richard,Imperial Beach,CA,91932-1021
May,Dana,Garden Grove,CA,92840-4208
Jensen,Brett,La Habra Heights,CA,90631-8025
Bogin,Ronald,El Cerrito,CA,94530-1424
Boyle,Lea,Danville,CA,94526-2238
Schenk,Barbara,Beverly Hills,CA,90212-4402
Reinhart,Robin,San Diego,CA,92104-4907
Marble,Linda,San Francisco,CA,94132-3034
Gonzalez,Pete,Topaz RD,CA,92392
Boyd,Kerry,Redwood City,CA,94062-2039
P. Peterson,David,San Diego,CA,92116-4841
Shepherd,Irana,Santa Cruz,CA,95060-7120
Gardner,Allison,Redding,CA,96003-7639
Scull,Sharon,Pasadena,CA,91103-1141
Chirpin,Robert,Northridge,CA,91324-2906
Burkhart,Jens,Santee,CA,92071-2668
Schwartz,Marge,Santa Barbara,CA,93121-1955
Konigsberg,Susanne,Los Angeles,CA,90069-1208

Lee,Charlotte,Seaside,CA,93955-1098
Gilbert,Tracy,Rialto,CA,92377-8831
Herring,Rod,Hermosa Beach,CA,90254-2013
Miller,William Joseph,Los Angeles,CA,90027-4045
Sealy,Berenice,Rancho Cucamonga,CA,91737-1716
Thompson,Ann,Crescent City,CA,95531-3652
McChesney,Terri,Los Angeles,CA,90017-2034
rosenblatt,roy,Sherman Oaks,CA,91403-5053
appel,mary,Sacramento,CA,95811-4194
Lakota,Anne,Mill Valley,CA,94941-1516
Scibetta,Kimberly,Shadow Hills,CA,91040-1427
Long,Ned,Los Osos,CA,93402-4438
Fernandez,Magaly,San Francisco,CA,94124-2345
Chadderton,George,San Ramon,CA,94583-1265
Cardella,Sylvia,Hydesville,CA,95547-9416
Schmidtke,Suzanne,Valley Village,CA,91607-2209
Rhodes,Janet,Cathedral City,CA,92234-8935
Bowers-Gachesa,Wendy,Watsonville,CA,95076-0429
Gamble,Sandra,Ridgecrest,CA,93555-5118
Magdalene,Lilith,Middletown,CA,95461-1478
Healey,Shannon,San Carlos,CA,94070-2334
Hickman,Jessica,Valencia,CA,91355-4961
Miyashita,Charlene,Mountain View,CA,94041
persky,jerry,Santa Monica,CA,90403-2217
Kaiser,Sharon,Sebastopol,CA,95472-3426
Olson,Jeffery,Vista,CA,92084-2840
Irwin,Melanie,Ventura,CA,93003-6472
Logan,Lucy,San Jose,CA,95117-1618
Chan,Chung-Wei,San Jose,CA,95116-2274
Kroon,Lee,Windsor,CA,95492-9700
Alexander,Claude,Pasadena,CA,91107
Comrack,Janine,Ojai,CA,93023-1553
O'Keefe,Lauren,West Sacramento,CA,95605-2166
Clark,Guy,Los Gatos,CA,95033-8990
Marshall,Narcis,Malibu,CA,90265-4011
Gonzalez,Gretchen,San Diego,CA,92131-1345
Azizi,Amir,Los Angeles,CA,90027-1571
Anderson,Jo Ann,Woodland,CA,95776-5101
Speisman,Berta,Laguna Woods,CA,92637-8837
Gordon,Billie,Los Gatos,CA,95032-3441
rosselli,judith,San Diego,CA,92122-4116
cairns,christopher,Lakeport,CA,95453-3623
Tatman,Robin,Vallejo,CA,94591-6301
Benson,Bruce,Newbury Park,CA,91320-4745
Zatman,Mari,San Francisco,CA,94103-3919
Essenmacher,Barbara,Modesto,CA,95351-3062
Gregory,Anne,Palo Alto,CA,94303
raven,robert,Novato,CA,94945-1686

Woodbury,Diana,South Lake Tahoe,CA,96155-0252
Drobny,Edith,Los Altos,CA,94024-3120
Fisk,Todd,San Diego,CA,92131-3573
Rian,Jill,Oakland,CA,94602-1629
Snelling,Philip,Clearlake,CA,95422-7906
Evans,Keisha,East Palo Alto,CA,94303-2633
Nicholson,Graeme,Marina Del Rey,CA,90292-5439
Howard,Joann,San Diego,CA,92128-3652
Sedivy,Richard,Los Angeles,CA,90042-1401
Orcholski,Gerald,Pasadena,CA,91104-3427
Samis,James,Rancho Palos Verdes,CA,90275-4660
greenburg,stu,Stevenson Ranch,CA,91381-1142
Hanson,Gail,Forestville,CA,95436
Kaiser,Kathleen,Chico,CA,95928-6917
Harper,Charesa,Glen Ellen,CA,95442-9743
Christopher,Sandra,Burbank,CA,91505-1856
Galluzzo,Carolyn,Oxnard,CA,93036-5392
Kornet,Robert,Simi Valley,CA,93065-3901
Krois,Madeleine,San Francisco,CA,94122-2104
Hensley,Kim,Stockton,CA,95212-3108
Gold,Vicki,Mount Shasta,CA,96067-9730
Isaac,David,Livermore,CA,94551-7511
Seeberger,Joan,Palm Desert,CA,92260-4646
Baxter,Jo,Santa Monica,CA,90402-1619
Saifer,MARlene,Venice,CA,90291-4565
Caprio,Ellen,San Diego,CA,92131-3724
A'Becket,Suzanne,Cupertino,CA,95014-5707
Wells,R,Los Angeles,CA,90020-2727
Coleman,David,Cobb,CA,95426
Langlois,Cheri,Mendocino,CA,95460-1286
Tiaven,Marilyn,Oakland,CA,94605-5642
Cleveland,George,Santa Clara,CA,95051-5626
Holt,Jane,Los Altos,CA,94024-6907
Sumida,Kathleen,San Diego,CA,92120-1333
TRINQUE,ERIC,Ventura,CA,93001-1860
D'Andrea,Stephen,Los Altos,CA,94022-1774
Warren,Mashuri,Lafayette,CA,94549-1807
Ruby,Jacki,Berkeley,CA,94704-3408
Burgess,Barbara,Napa,CA,94559-4441
Pielke,Janet,Claremont,CA,91711-3580
Ballinger,Dan,Alameda,CA,94502-6668
Zielke,Karen,San Jose,CA,95124-5424
Cochran,Joyce,San Francisco,CA,94118-2846
Chapin,Marcy,San Luis Obispo,CA,93401-7607
Spriet,Doreen,Newport Coast,CA,92657-1017
Starsheen,Michael,Dunsmuir,CA,96025-2722
Gantos,Angela,Tiburon,CA,94920-2010
Harband,Katherine,San Rafael,CA,94913-4180

Turley-Sinclair, Jean, Grass Valley, CA, 95949-6817
Alvarez, Marizela, La Canada Flintridge, CA, 91011-1439
Ashikeh, Karen, Hayward, CA, 94544-2839
Matteucci, Gina, Sacramento, CA, 95822-2922
Carter, Sophie, Foothill Ranch, CA, 92610-1705
Monaco, Darlene, Sacramento, CA, 95828-3126
Lewis, Sherman, Hayward, CA, 94542-1616
"Ackerman, M.D.", John, Santa Barbara, CA, 93130-0642
Olson, M., Sunnyvale, CA, 94086-6423
Villalobos, James, Los Angeles, CA, 90027-4201
Oman, Robert L., Sylmar, CA, 91342-1360
gianelli, marge, San Diego, CA, 92124-4017
Newstead, Susan, Boonville, CA, 95415-0740
Gunther, Deborah, Santa Barbara, CA, 93105-2129
Ebding, Kyle, Santa Cruz, CA, 95062-1132
Harrison, Colleen, Rncho Cordova, CA, 95670-4220
Smith, Scott, Corona, CA, 92879
Skorheim, Linda, Temple City, CA, 91780-2451
Lafler, Claude, Chino Hills, CA, 91709-2723
Nathan, Steve, Piedra, CA, 93649
Mitsuda, Michael, Fremont, CA, 94555-1285
Parramore, Jennifer, San Diego, CA, 92106-1365
Moody, Janeane and Ian, Sausalito, CA, 94965-2512
Garcia, Elena, Anaheim, CA, 92805-5012
Freeman, J, El Cerrito, CA, 94530-3302
Mullins, Glenn, Buena Park, CA, 90620-1269
LEHNER, Zheindl, Berkeley, CA, 94710-2545
Schnack, Gabriele, Marina Del Rey, CA, 90292-5512
Semper, Elena, Sherman Oaks, CA, 91423-2606
Halington, Merina, Belmont, CA, 94002-1432
Spain, Nikayla, Fresno, CA, 93705-0328
Edinger, Elizabeth, North Hollywood, CA, 91601-3981
Elliott, Susan, Concord, CA, 94521-4513
Antonio, E., Santa Monica, CA, 90404-2759
Kelly, Bev, Long Beach, CA, 90803
Benjamin, Corey, Los Angeles, CA, 90006-2866
Peters, Sheryl, Scotts Valley, CA, 95066-2645
Boor, Carolyn, Rancho Cucamonga, CA, 91730-6893
O'Connor, Willa, Kensington, CA, 94708-1119
Moehle, Mary, San Francisco, CA, 94116-1349
Salas, Karla, Chino, CA, 91710-2460
Mackey, David, Martinez, CA, 94553-3770
Gardner, Paul, San Jose, CA, 95128-3404
Morrow, Terry, Coarsegold, CA, 93614-9059
Harvey, Shea, Napa, CA, 94558-5101
M, Hannah, norwalk, CA, 90650-7748
Rath, Karen, Oakland, CA, 94619-2717
Rabe, Michael, Chatsworth, CA, 91311-1309

Gordon,Eve,Tarzana,CA,91356-1705
Reed,Robert,Laguna Beach,CA,92651-1870
Gang,Peter,Petaluma,CA,94952-1703
robertson,jessica,la,CA,90403
Anderson,Dan,Roseville,CA,95747-5045
Frandsen,Karla,San Diego,CA,92128-2608
Metheny,Ron,Cardiff By The Sea,CA,92007
Kalionzes,Todd,Signal Hill,CA,90755-2148
Edora,Cheryl,Elk Grove,CA,95758-8076
Sperber,Damon,San Francisco,CA,94114-1614
Moreno,Kim,La Crescenta,CA,91214-3229
Okeefe,Alice,Anaheim,CA,92804-3035
Lacagnina,Susannah,Santa Monica,CA,90405-3156
Holcomb,Deborah,Los Angeles,CA,90025-6314
Kellman,Lisa,San Francisco,CA,94131-2229
Copeland,Todd,Ventura,CA,93003-1808
Babcock,Miles,Garden Grove,CA,92840-1740
Kelly,Bev,Long Beach,CA,90803-3515
Gladbach,Andrew,Burbank,CA,91502-1043
Herbert,Beverly,Santa Barbara,CA,93110-1029
Lazure,Rende,Napa,CA,94559-3513
Robertson,C. Alton,Redlands,CA,92373-6146
Holz,Dennis,Encinitas,CA,92024-2226
Darling,Cindi,Fairfax,CA,94930-1819
Collins,David,Fresno,CA,93720-4486
Odom,Cassandra,Long Beach,CA,90802-2026
Opffer,Elenie,Santa Monica,CA,90404-3261
Brownell,Deirdre,Burbank,CA,91504-3817
christiansen,rob,Laguna Beach,CA,92651-3103
Ramirez,Silvia,Capitola,CA,95010-0133
McCartney,Kimberly,Sebastopol,CA,95472-3050
Olson,Amanda,La Mesa,CA,91941-5551
Wong,Peter,San Francisco,CA,94131-3138
Sixtus,Michael,Santee,CA,92071-2252
Hunter,Catherine,La Crescenta,CA,91214-1534
Spirito,Louis,Malibu,CA,90265-4461
Thunen,Erif,Albion,CA,95410-0184
Lee,Susie,La Habra,CA,90631-7018
Nordstrom,Krista,San Francisco,CA,94114-1234
Goble,Kristin,Sacramento,CA,95821-5419
Shadle,Linda,Anaheim,CA,92804-5268
Jordan,John,Fresno,CA,93702-2803
Izquierdo,Eduardo,Santa Cruz,CA,95060-3538
McMorrow,Philip,Calabasas,CA,91301-5211
Reitman,Richard,Menlo Park,CA,94025-3028
Hudgins,Jerry,Point Reyes Station,CA,94956-1408
Quintana,Jennifer,Los Angeles,CA,90022-1947
Vanden Bossche,Ed,Newport Beach,CA,92663-2921

D,Alex,Valencia,CA,91355-0961
Andrews,Leslie,Santa Cruz,CA,95060-5003
Choy,Chris,San Francisco,CA,94112-2949
Watts,Carol,Placentia,CA,92870-6026
Quilenderino,Yvonne,Seaside,CA,93955-6758
Collins,Laura,Sacramento,CA,95818-1275
Gee,Steffanie,Los Angeles,CA,90064-2484
Lefler,Jacque,Sebastopol,CA,95472-3582
Wobermin,Victoria F.,Los Osos,CA,93402-4456
Berk,Heather,Fountain Valley,CA,92708-6858
Clark,Leigh,Granada Hills,CA,91344-6858
Moise,Mark,Oxnard,CA,93033-4530
Neel,E Ann,Sebastopol,CA,95472-9508
Stonehawk,Mika,Tustin,CA,92782-8008
Footman,Farel,Los Angeles,CA,90065-3955
Waddell,Christine,Emeryville,CA,94608-2606
Canter,M.,Belvedere Tiburon,CA,94920-2036
Logan,Frances,San Diego,CA,92117-6101
Franco,Rita,Monrovia,CA,91016-3833
Martindale,Patricia,Martinez,CA,94553-2738
Pruitt,David,Yucca Valley,CA,92284-3160
Romero,Veronica,San Jose,CA,95124-5329
westhoff,darla,Whittier,CA,90603-2816
Beck,Jenna,Valley Springs,CA,95252-8343
Fisher,Rita,Los Gatos,CA,95030-7509
Niebel,Stuart,Ojai,CA,93023-2507
Rouse,Stacy,Malibu,CA,90265-4754
Siegel,Charles,Berkeley,CA,94709-2117
Norell,Sandy,Caliente,CA,93518-2821
Traeger,Andrea,Beverly Hills,CA,90210
baker,debra,San Francisco,CA,94107-2081
Gutierrez,Sandra,San Bruno,CA,94066-1815
Korfmacher,Blanche,San Francisco,CA,94132-1661
Toth,Jennifer,Santa Clarita,CA,91350-3694
Rosenfeld,Wendy,N Hollywood,CA,91601-4464
Tunder,Russell,Woodacre,CA,94973-0882
Lundgreen,Kenneth,San Francisco,CA,94109-9052
Bare,Diane,Santa Rosa,CA,95404-7737
Stone,Peggy,San Diego,CA,92101-6736
Gregorian,Arthur,Oakland,CA,94602-1628
lentz,therese,Pasadena,CA,91107-3856
Davis,Pat,Woodland Hills,CA,91364-1805
Anderson,Sheryl,Bakersfield,CA,93306-2818
Evarts,Jay,Volney In,CA,92024
Pavdun,Myron,Burlingame,CA,94010-3675
Alvarez,Maria E,San Francisco,CA,94115-5274
Kidd,Joyce,Beverly Hills,CA,90210-1423
Shindler,Stephanie,San Francisco,CA,94103-3330

Hemenway, Peter, San Francisco, CA, 94127-1723
Silverman, Marc, Los Angeles, CA, 90068-3071
Gajewski, Carol, Carlsbad, CA, 92011-3955
Alexzander, Deborah, Castro Valley, CA, 94546-2271
Gremban, Ronald, Corte Madera, CA, 94925-1268
Ines, Carolita, Carlsbad, CA, 92008-3359
Hadley, Marlyne, Clayton, CA, 94517-1433
Thomsen, Brett, Redondo Beach, CA, 90278-1310
johnson, arnold, Los Angeles, CA, 90017-1908
Essman, John, Healdsburg, CA, 95448-1381
Spencer, Ande, Redlands, CA, 92373-5253
Erario, Myra, Castaic, CA, 91384-4323
Hansen, Sue, San Anselmo, CA, 94960-1341
P, Ed, Signal Hill, CA, 90755-3506
Jennings, Roger, San Diego, CA, 92110-5643
Correll, Nancy, Mckinleyville, CA, 95519-4005
Wesson, Frances, Hemet, CA, 92545-1111
Layton, Barbara, Los Angeles, CA, 90006-5220
Dogole, Ian, Mill Valley, CA, 94941-4090
Vesely, Sakura, Martinez, CA, 94553-1456
Briggs, Janice, Martinez, CA, 94553-6240
Blasco, Natalie, Anderson, CA, 96007-8901
Keller, Benjamin, Oakland, CA, 94618-1335
Berzon, Leah, Solana Beach, CA, 92075-1700
Berdonado, Adalia, Hayward, CA, 94545-3307
Sorensen, Lenore, Kensington, CA, 94707-1319
Calame, Jane, San Francisco, CA, 94118-1272
Conrad, Eric Tyler, Morro Bay, CA, 93442-2435
Velez-Flores, Noel, Los Angeles, CA, 90023-2200
Hom-Roan, Victoria, Tracy, CA, 95377-6700
Blount, Terry, San Jose, CA, 95110-2761
Griffin, Sharon, San Diego, CA, 92110-1225
Kelly, Nancy P., Oakland, CA, 94605-1177
Wilson, Janae, Seal Beach, CA, 90740-5728
Redish, Maryellen, Palm Springs, CA, 92264-0648
Mikolowski, Malorie, Stockton, CA, 95207-5234
Morgan, Linda, San Pablo, CA, 94806-3767
Fielder, Aixa, Los Angeles, CA, 90016-1515
Maizel, Yefim, San Francisco, CA, 94131-1621
Summers, Susan, Carmichael, CA, 95608-2727
Khalsa, Simran, Los Angeles, CA, 90034-2009
Van Zee, Ali, Oakland, CA, 94610-2420
n, m, San Francisco, CA, 94102
Peterson, Kim, Cloverdale, CA, 95425-3551
Branson, Larry, Pomona, CA, 91767-4739
Jache, Elizabeth, Lemon Grove, CA, 91945-3716
Buehler, Robert, Elk Grove, CA, 95624-5025
Centoni, Marilyn, Redwood City, CA, 94063-3951

McKelvey, Gerald, Manteca, CA, 95336-5051
Morris, David, Oakland, CA, 94618-1213
Griffin, Erica, San Francisco, CA, 94115-4323
Chatard, Christopher, San Diego, CA, 92116-1739
Cass, Mike, Novato, CA, 94947-4766
Sanderson, Michele Dawn, Walnut Creek, CA, 94595-3793
Masuoka, Linda, Redondo Beach, CA, 90277-2560
Elbrecht, Mary, Santee, CA, 92071-4633
Frankham, Stephen, Granada, CA, 18100
Baldwin, Lauren, Vista, CA, 92081-7359
Reveles, Yaya, Long Beach, CA, 90802-5875
dorazio, maxine, Lafayette, CA, 94549-2922
Laipple, Mitch, Millbrae, CA, 94030-1233
Burnham, Jill, Loma Linda, CA, 92354
Sparks, A, Castro Valley, CA, 94546-2878
timoya, akiba, Oakland, CA, 94605-2222
Wood, Mary, San Luis Obispo, CA, 93405-1769
Esposito, Dan, Manhattan Beach, CA, 90266-4082
Stiefel, Catherine, San Diego, CA, 92106-3020
Byrne, Barbara, San Francisco, CA, 94121-3523
Arace, Marylucia, Fullerton, CA, 92835-4020
Heinly, Bridgett, San Diego, CA, 92107-4210
Clayson, Wyllie, Santa Ana, CA, 92706-1610
Smith, Nancy, San Diego, CA, 92106-2743
Schlesinger, Sandra, Sausalito, CA, 94965-1439
Howard, Mark, Berry Creek, CA, 95916-9759
Rosenblum, Stephen, Palo Alto, CA, 94301-3939
Renfrow, Carole, La Quinta, CA, 92253
Leonard, Paul, Mill Valley, CA, 94941-2119
Phillips, Josette, San Pablo, CA, 94806-1413
Freeman, J, El Cerrito, CA, 94530-3302
Morrison, Thomas, Sherwood Forest, CA, 91325-2933
Gonzales, Antoinette, Victorville, CA, 92392-7988
Meyers, Cindy, Capitola, CA, 95010-0423
Owens, Brandon, San Francisco, CA, 94118-3418
Reese, Jessica, Upland, CA, 91784-1582
Lawyer, Julie, Benicia, CA, 94510-1434
Davis, Stacy, Bakersfield, CA, 93306-7874
cross, steve, Redlands, CA, 92373-5815
ORRANGE, Mary, Mountain View, CA, 94040-2316
Emsley, Laurel, Carmel, CA, 93923-9739
McArdle, Tim, Northridge, CA, 91326-1028
Schillo, Noah, Sonoma, CA, 95370-8586
Nolan, Katherine, Cupertino, CA, 95014-2455
Kimbauer, Elli, Crescent City, CA, 95531-4335
Evask, Melissa, Eureka, CA, 95501-0318
Shapiro, Carol, Auburn, CA, 95603-4034
Freeman, Briana, San Jose, CA, 95124-5409

schroeder,cynthia,Castaic,CA,91384-4402
Berman,Steven,Berkeley,CA,94703-1663
Holmes,Ben,San Francisco,CA,94117-2207
Katz,Marilyn,Los Angeles,CA,90069-1344
girard,brian,Ventura,CA,93004-2454
Fogan,Sara,Valencia,CA,91385-0552
Granberg,Ronald,North Hills,CA,91343-3416
Ung,Kera,Monterey Park,CA,91755-3911
Khalsa,Avtar,los Angeles,CA,90034
Greene,Chris,Arbuckle,CA,95912-9567
Nechifor,Talida,Riverside,CA,94501
Tobar,Donna,Irvine,CA,92602-1004
Dominguez,Marisol,Linden,CA,95236-9419
Daniels,Bruce,Capitola,CA,95010-1640
Thorley,Douglas,Colfax,CA,95713-9563
Dodd,John,San Francisco,CA,94107-4097
Hauge,Zola Vanessa,Beaumont,CA,92223-6235
Burak,Tanya,La Quinta,CA,92253-7953
Tichman,Nadya,Oakland,CA,94602-1929
B.,N.,Oakland,CA,94602
Cross,Charley,Sacramento,CA,95831-2929
Koehler,Kristie,El Cerrito,CA,94530-3014
Masullo,Annie,San Francisco,CA,94114-3361
Shen,Elizabeth,Mountain View,CA,94043-2167
Kelly Poh,Mary Frances,Benicia,CA,94510-3748
kaehn,s,Oakland,CA,94601-4354
Wherrit,Thamar,Mount Shasta,CA,96067-0708
Abbott,Galen,San Francisco,CA,94107-2703
Applen,Kirstie,San Francisco,CA,94122-3509
Castaneda,Manuel,West Covina,CA,91790-3948
Solano,Dalia,Santa Ana,CA,92707-3352
Dupree,Sarah,Carlsbad,CA,92009-3035
Anthony,Elizabeth,San Jacinto,CA,92581-0695
Davis,Mike,Three Rivers,CA,93271-9731
Singh,Bobby,Mill Valley,CA,94941-2617
Buchanan,Betty,Bakersfield,CA,93308-7883
Carlson,Nathan,Thousand Oaks,CA,91360-1533
Zussin,Rebecca Gomez,Los Olivos,CA,93441-0740
Tyler,Rosie,San Bruno,CA,94066
Crum,Cathy,Agoura Hills,CA,91301-3508
Crockett,Shan,Aptos,CA,95003-2652
Letoile,Sarah,San Francisco,CA,94129-2815
Perricelli,Claire,Eureka,CA,95501-1312
Del Vecchio,Cheryl,Loomis,CA,95650-8797
Peterson,Stanley,Los Banos,CA,93635-3223
ANGLE,ROGER,Long Beach,CA,90802-2835
Ruf,Windii,Wildomar,CA,92595-8328
Peterson,Connie,Pismo Beach,CA,93449-2029

Anderson, Frank B., San Pedro, CA, 90731-1840
Chandler, Elizabeth, Santa Cruz, CA, 95060-2301
Harris, Anne, Placerville, CA, 95667-9142
Mezzavilla, Richard, Walnut Creek, CA, 94598-2743
Sosa, William, Oxnard, CA, 93033-3359
Revenu, Elisabeta, San Francisco, CA, 94131-2430
Schroeder, Sheryl, Santa Barbara, CA, 93101-7034
Rhein, Robert, San Diego, CA, 92124-1219
Bagheroghli, Layla, Danville, CA, 94526-4931
Kingett, Kathie, La Habra Heights, CA, 90631-8057
Weeden, Noreen, San Francisco, CA, 94107-2325
Willard, Ken, Chula Vista, CA, 91910-1710
Wilson, Leland, La Verne, CA, 91750-4333
Arguello, Frances, Chino, CA, 91710-4629
Hunt, June, Berkeley, CA, 94707-1604
Sweger, Tamara, Tiburon, CA, 94920-2042
Trama, Patricia, Dublin, CA, 94568-3420
Huss, Richard, Richmond, CA, 94804-5617
Brooks, Kendra, Seal Beach, CA, 90740-6514
Estes, E.H., Mountain View, CA, 94041-1051
Merten, Pamela, Torrance, CA, 90505-2621
Perkins, Bruce, Escondido, CA, 92025-6301
Yerena Jr, Julian, Parlier, CA, 93648-2706
Costanzo, Erica, Oceanside, CA, 92058-1667
Huwe, Mike, Redondo Beach, CA, 90277-3117
Murphy, Kathryn, Santa Cruz, CA, 95062-4020
Wallace, James, Little River, CA, 95456
Picketts, Sherra, San Francisco, CA, 94117-2520
Kinnersly, Tal, Itoigawa, CA, 94913
Lane, Debra, Fort Bragg, CA, 95437-6104
Burns, Peggy, Rowland Heights, CA, 91748-4718
Cerny, Jayne, Inverness, CA, 94937-0241
Mejia, Marianna, Soquel, CA, 95073-9708
Jones, Jay, Upland, CA, 91786-8123
Van Der Meij, Alexandra, Badhoevedorp, CA, 11711
Walden, Kristin, Newbury Park, CA, 91320-3548
Berg, Elaine, Simi Valley, CA, 93065-7369
Nahigian, Kenneth, Sacramento, CA, 95827-3266
Bidwell, John, Berkeley, CA, 94702-2134
Quon, Marjorie, Redwood City, CA, 94063-3018
green, patty, Carmichael, CA, 95608-6416
Medeiros, Carol, Elk Grove, CA, 95758-7429
Aviles, Natalia, Tarzana, CA, 91356-1158
Powell, Dale, Riverside, CA, 92507-4755
Cornelius, Stacy, Laguna Beach, CA, 92651-1846
Savicky, Debi, Corona, CA, 92882-4803
Quevedo, Edith, Riverside, CA, 92504-3494
Gorndt, Isabelle, Van Nuys, CA, 91406-5711

Kampa, Jan, Soquel, CA, 95073-2739
Here, Ads, Davis, CA, 95618-2577
Alvarez-Oppus, Sonia, San Jose, CA, 95110-1441
Kelley, Tony, Sacramento, CA, 95821-0072
Miranda, Rocio, Oakland, CA, 94619-1833
simon, nancy, Santa Barbara, CA, 93101-2352
Rettinghouse, Theresa, Alameda, CA, 94501-1442
Johnson, Joyce, Oroville, CA, 95966-6956
Normandin, Lareine, Laguna Beach, CA, 92651-2039
McGowan, Michael, Orinda, CA, 94563-1127
Petrone, James, Los Angeles, CA, 90027-1302
Taylor, Linda, Aptos, CA, 95003
Smith, Sarah, Rancho Santa Margarita, CA, 92688-3244
Barner, Linda, Fresno, CA, 93726-3322
King, A E, San Diego, CA, 92130-2527
Catron, Cheryl, Sunnyvale, CA, 94085-3124
Minick, Clotine, Littlerock, CA, 93543-1414
Pettis, Carolyn, Canyon Country, CA, 91387-3138
Smith, Sandy, Sebastopol, CA, 95473-2199
Nillo, Christina, W Hollywood, CA, 90069-5525
Miller, Sandi, Orange, CA, 92867-3837
Delgado, Stacey, Irvine, CA, 92602
Cohenour, Dolores, San Diego, CA, 92106-1502
Willens, Sheila, Los Angeles, CA, 90046-1235
Stenberg, Eystein, San Francisco, CA, 94107-3657
Rose, Barbara, Fremont, CA, 94536-4130
hirayama, bruce, Los Angeles, CA, 90034-7005
Carnegie, Sheila, San Rafael, CA, 94901-2127
ramer, andrew, oakland, CA, 94610-4200
Rogie, Barbara, Alameda, CA, 94501-1825
Fisch, Greg, San Diego, CA, 92130-6754
moe, julie, Pomona, CA, 91766-4720
Kast, Michael, Panorama City, CA, 91402-1476
Rebaric, Keith, Costa Mesa, CA, 92627-4661
Jaime, Tina, San Jose, CA, 95124-2801
Seiji, Lorraine, El Cerrito, CA, 94530-3217
James, Damian, Oakland, CA, 94609
Stevens, Joanne, Los Angeles, CA, 90046-3065
Mallory, Brad, Fresno, CA, 93720-4618
Shay, Kristin, Newport Beach, CA, 92663-4227
Matlock, Gary, Westminster, CA, 92683-6157
Cobb, John, Claremont, CA, 91711-4236
Edwards, Jane, La Palma, CA, 90623-1640
Sherrill, Tawny, Garden Grove, CA, 92845-1940
Goldstein, Susan, Danville, CA, 94526-2238
Maloney, Bonnie, Hawthorne, CA, 90250-8393
Livesey-Fassel, Elaine, Los Angeles, CA, 90064-4523
Miros, Caroline, Fairfax, CA, 94930-1408

Kegler-Williams, Isla, San Pedro, CA, 90731-6213
Holzer, Rebecca, Huntington Beach, CA, 92646-6272
Shek, Mei-Ling, Sunnyvale, CA, 94087-3544
Howard, Sandra, Eureka, CA, 95503-5311
Saunders, Richard, Oakland, CA, 94609-1124
Campbell, Allan, San Jose, CA, 95132-1920
Sachdeva, Dinesh, Woodland Hills, CA, 91367-4241
Huang, Karissa, Sunnyvale, CA, 94086-8230
Flores, Alex, Oceanside, CA, 92056-4948
Murdock, Lauren, Santa Barbara, CA, 93110-1650
Thronson, Kristina, Avalon, CA, 90704-1683
Neukermans, Armand, Portola Vally, CA, 94028-8019
Lane, Nancy, S Pasadena, CA, 91030-4610
Dietrich, Laura, San Diego, CA, 92120-2229
Kohfeld, Virginia, Santa Monica, CA, 90402
Marcus, Martin, San Diego, CA, 92120-1112
Blum, Daniel, Gilroy, CA, 95020-5924
Stamos, James, Saratoga, CA, 95070-4910
Zelniker, Michael, Los Angeles, CA, 90068-2416
Crockett, Ann, Los Altos Hills, CA, 94024-6538
Pruce, Jerry, Redway, CA, 95560-2349
Ryba, Dominique, Vista, CA, 92083-4002
Garritty, Coleen, Watsonville, CA, 95077-2047
Miller, Aaron, Sherman Oaks, CA, 91423-3308
Zimmermann, Matt, Escondido, CA, 92027-4407
Wolfberg, Amy, Los Angeles, CA, 90046-2355
Ettinger, Emily, Encino, CA, 91316-3000
Stoker, Cayley, Los Angeles, CA, 90049-6373
Bolton, Kate, Petaluma, CA, 94952-2921
Flower, Maggie, Del Mar, CA, 92014-3612
Davis, Elizabeth, Davis, CA, 95616-0146
Ablog, Heather, El Dorado Hills, CA, 95762-9552
Bagshaw, Dana, Santa Cruz, CA, 95060-4934
Moran, Charles, Novato, CA, 94947-4331
Forman, Deborah, North Highlands, CA, 95660-5653
Lane, Don, Los Angeles, CA, 90020-4462
Bergdolt, Caroline, San Francisco, CA, 94129-1256
Ahmadi, Fazilt, Temecula, CA, 92592-6319
Rothman, Diana, Santa Cruz, CA, 95060-3640
Schumaker, Karl, Boulder Creek, CA, 95006-9718
Esser, Nicholas, Simi Valley, CA, 93065-4326
Nilsson, Eric, Chico, CA, 95926-2859
Galasso, William, Laguna Woods, CA, 92637-8090
Ryan, Tim, Capistrano Beach, CA, 92624-1330
Riviere, Tom, Temecula, CA, 92592-1104
Tamori, Carolee, Oroville, CA, 95966-9244
Wallace, Bruce, Vista, CA, 92084-4207
Prochazka, Penelope, Simi Valley, CA, 93063-1408

Hancock, Joseph, Los Angeles, CA, 90028-8266
Sandus, Scott, Huntington Beach, CA, 92649-1214
Hays, Rita, Hercules, CA, 94547-2082
Savala, Elke, El Cerrito, CA, 94530-3824
G, C, San Diego, CA, 92122
Barnett, Michael, San Francisco, CA, 94112-3544
Byrd, Ann, Davis, CA, 95616
Mendez, Ricardo, Los Angeles, CA, 90036-2519
Heinz, Tom, San Rafael, CA, 94901-3609
Hardin, Marian, Daly City, CA, 94015-4555
gregg, brandon, Burlingame, CA, 94010-7516
Ellis, Koll, Kensington, CA, 94707-1245
London, Diane, Woodland Hills, CA, 91365-0613
Flynn, Joseph, Sacramento, CA, 95815-3533
Colldar, Brenda, Clovis, CA, 93611-3005
Spencer, Natalie, Alameda, CA, 94501-3870
Matsumoto, Mari, Alameda, CA, 94501-1509
Johnson, Mara, Santa Clarita, CA, 91390-5716
Galloway, Sara, Simi Valley, CA, 93065-3486
Jones, Claire, Hanford, CA, 93230-6747
Flannery, Constance, San Francisco, CA, 94131-2704
Walden, Deborah, Diamond Bar, CA, 91765-1558
Kawano, Karen, Torrance, CA, 90505-6407
Monahan, Joy, Riverside, CA, 92506-7584
Mullin, Stan, Irvine, CA, 92603-3907
McCrink, Laurie, Rancho Santa Fe, CA, 92067-0190
COHEN, MARVIN, Walnut Creek, CA, 94595-2433
Phelps, Tami, Redding, CA, 96003-3119
Bianchi, Steve, Newcastle, CA, 95658-9302
Ridder, Lynette, Concord, CA, 94521-2910
Tanimura, Pam, Carmichael, CA, 95608-6609
Larsen, Brent, San Diego, CA, 92103-1251
Rearden, Chance, West Hollywood, CA, 90046-4728
Lee, Ardath, Santa Rosa, CA, 95405-6646
Geluz, Gemma, Fairfield, CA, 94533-1469
Richard B. Marks, Michael C. Ford and, Watsonville, CA, 95076-2018
Seapy, Roger, Los Alamitos, CA, 90720-4153
Luhring, Carl, Vista, CA, 92081-8829
Weiner, Nona, San Jose, CA, 95127-1433
Stanley, Edh, Sacramento, CA, 95823-1457
Yoskowitz, Ken, Paradise, CA, 95969-6606
Nicodemus, Sharon, Sacramento, CA, 95821-5642
Aurin, Trina, Foothill Ranch, CA, 92610-2305
Bailey, Norene, Santa Cruz, CA, 95062-1666
San Cartier, Terry, Santa Maria, CA, 93455-7108
Seas, Arlo, Huntington Beach, CA, 92648-3321
Ingram, Harriet, San Francisco, CA, 94131-1800
sharma, shirley, Stockton, CA, 95202-1303

Williams,Carol,Etna,CA,96027-9515
Hustler,Jeffrey,Whitethorn,CA,95589-9179
Davenport,Jeanne,Long Beach,CA,90808-2820
Young,Andrew,Oakland,CA,94618-1430
Roth,Wayne,San Mateo,CA,94403-3036
Richmond,Lonna,Muir Beach,CA,94965-9757
Trevethan,Evelyn,Napa,CA,94559-2133
Conley Jr,Leodis,El Sobrante,CA,94803-1801
Leary,Nicholaus,San Clemente,CA,92672-3713
Simms,Willard,Woodland Hills,CA,91367-1413
Clarke,Darrell,Pasadena,CA,91101-2568
Barile,Kathryn,Fresno,CA,93728-2304
ellenberger,carol,Morgan Hill,CA,95037-6821
Ng,Pius,Cupertino,CA,95014-3554
Rocha,Candy,Los Angeles,CA,90033-1612
Hays,J.,Davis,CA,95616-5270
Waller,Paul,Woodland Hills,CA,91367-6013
Mock,Carol,Fremont,CA,94536-1601
Kroosz,Linda,Half Moon Bay,CA,94019-1771
Jordan,Janine,Encino,CA,91436-3822
Talbot,Brian,Altadena,CA,91001-4537
Harris,John,Pittsburg,CA,94565-0410
Desantis,Richard,Palm Desert,CA,92260-6120
Thomas,Ellie,Redlands,CA,92373-6936
Hawley,Louise,Palm Springs,CA,92264-7932
Abbott,Billie,Marina,CA,93933-3171
Hazelleaf,Thomas,Seal Beach,CA,90740-3056
Reed,Michael,Los Angeles,CA,90065-2613
Haskins,David,San Diego,CA,92105-1264
Barba,Patsy,Los Angeles,CA,90026-5374
Gilbert,Camille,Santa Barbara,CA,93101-4045
Reynolds,Margarite,San Francisco,CA,94107-2384
Fogel,Byron,Van Nuys,CA,91402-4518
Anderson,Robert,Roseville,CA,95747-5814
Colangelo,Gina,San Mateo,CA,94403-2923
Jah,Joe,San Francisco,CA,94102-1205
Rysewyk,Rex,Temecula,CA,92592-7108
Ellis,Frank,Cathedral City,CA,92234-3350
katz,Sandra,Culver City,CA,90232-2950
Flaherty,Molly,Huntington Beach,CA,92648-3820
Barron,Rhea,Vallejo,CA,94589-2760
Picardi,Dan,Salinas,CA,93901-3329
Stewart,George,Santa Rosa,CA,95409-3018
c,k,Vista,CA,92084-2605
Powell,Elizabeth,Pacific Grove,CA,93950-4253
Mayper,Victor,Ben Lomond,CA,95005-9209
Calderon,Socrates,Spring Valley,CA,91977-4723
Davis,Ryan,Burbank,CA,91502

Markovich,Maya,Palo Alto,CA,94306-1236
Allphin,Beverly,Berkeley,CA,94703-1909
Hannant,Ann,Sebastopol,CA,95472-2522
Graham,William,Burbank,CA,91502
Butler,Tim,San Francisco,CA,94109-5368
Jacob,Karen,Napa,CA,94558-1313
Rea,Molly,Fairfax,CA,94930-1954
Britton,James,Montara,CA,94037
Keenan,Margaret,San Jose,CA,95129-3126
Lindsley,C L,vacaville,CA,95687
Mcfarlan,Thomas,Redondo Beach,CA,90277-5841
Lent,Kelli,Alameda,CA,94501-1603
Guy,Earl,Escondido,CA,92027-4451
Foti,Bernadette,Paso Robles,CA,93446
Tickes,Steven,Campbell,CA,95008-4217
De Lacy,Katherine,Murphys,CA,95247
Saporiti,Claudia,Hawthorne,CA,90250-4823
Cantu,Sonia,San Francisco,CA,94133-2809
Rapp,Leslie,San Diego,CA,92129-5712
Heinrichsen,David,San Jose,CA,95136-2951
Bauer,Alwen,Palos Verdes Estates,CA,90274-2006
Zhang,Aaron,San Diego,CA,92129-2285
Steinfeld,Gabriel,Oakland,CA,94610-3861
Oliver,Jerry,Sylmar,CA,91342-5503
Tinsley,Gail,Goleta,CA,93117-1004
Tautra,Mathilde,Ã. . .lesund,CA,90210
Bolsky,Debbie,Santa Monica,CA,90403-1162
Killingsworth,Tommy,San Diego,CA,92117
Lennox,Kent,San Francisco,CA,94134-2457
Porter,Cody,Yucaipa,CA,92399-5581
DeYoung,Joyce,Citrus Heights,CA,95621-0984
Heaviland,Minona,Santa Rosa,CA,95404-2505
Silver,Cassandra,West Hollywood,CA,90046-5229
Steffes,Wayne,Redding,CA,96001-2906
Tenney,Joanne,Escondido,CA,92026-1973
prochnik,ethan,Los Angeles,CA,90031-1612
Mattingly,Constance,El Cerrito,CA,94530-1915
Myers,Rachel,San Diego,CA,92102-1223
Delgado,Joao,Palo Alto,CA,94306-2357
Mcdermith,Mary R,Mountain View,CA,94040-4556
Stein,Cindy,Thousand Oaks,CA,91360-1522
Buck,Travis,San Diego,CA,92107-2526
McCalister,Janet,Paradise,CA,95969-3048
Smith,Leslie,Oakland,CA,94611-1806
carpenter,lu,San Francisco,CA,94131-1022
dottir,stella,Los Angeles,CA,90021-1525
Beckerman,Gary,Santa Ynez,CA,93460-9615
lentz,therese,Pasadena,CA,91107-3856

Shah-Rais,Mariam,Los Angeles,CA,90035-4324
Rosoff,Monica,Half Moon Bay,CA,94019-1774
Debits,Adriann,San Francisco,CA,94121-3549
Dooling,George,Alameda,CA,94501-3314
Giguere,Naren,Escondido,CA,92025-7024
Losh,Mary,Riverside,CA,92507-1101
Reitman,Richard,Menlo Park,CA,94025-3028
Hunnicut,Joan,Citrus Heights,CA,95621-6218
Kegler,Lori,San Pedro,CA,90731-6213
Updegrove,Susan,San Luis Obispo,CA,93401-5914
Parratt,Andrew,San Francisco,CA,94114-2944
Sparkman,Gregg,Palo Alto,CA,94301-2437
D'Agostino,Ronald,Richmond,CA,94805-1404
CALOIA,STEPHANIE,Oakland,CA,94612-3101
Easton,Carol,Aptos,CA,95003-9762
Anderholm,Jon,Cazadero,CA,95421-9580
Penhart,Maree,Oxnard,CA,93035-3743
Coffman,Gaye,Burbank,CA,91501-2420
Soto,Robert,La Quinta,CA,92253-6113
romero suarez,andres,Hermosa Beach,CA,90254-2034
Beseda,Mark,Stockton,CA,95209-4841
L,Heidi,San Francisco,CA,94107-1700
Mock,Neal,Truckee,CA,96161-4925
Perea,Licia,Los Angeles,CA,90027-4753
Runion,Paul,Ben Lomond,CA,95005-9420
Lomax,Isabella,Riverside,CA,92508-3220
Pitman,Tom,Burbank,CA,91506-1727
Griffith,Ann,Orinda,CA,94563-2045
Delgadillo,Arthur,Lakewood,CA,90715-1415
Bross,CT,Walnut Creek,CA,94597
Dingee,Lawrence,Pasadena,CA,91101-3222
Bailey,Ken & Linda,San Carlos,CA,94070-3524
Simmons,Johanna,Brentwood,CA,94513-6557
Handforth,Michael,San Diego,CA,92115-4922
Price,Kevin,Carmichael,CA,95608-3059
Cochran,Nathan,Burbank,CA,91506-3407
Bennett,Julie,El Dorado Hills,CA,95762-5283
Grainger,Elizabeth,Claremont,CA,91711-3225
Fish,Jason,Modesto,CA,95355-3714
Diaconoff,Nicole,San Francisco,CA,94109-7139
Sarabia,Michael,Stockton,CA,95207-5147
Piercy,Steven,Carlsbad,CA,92008-3576
frederick,heather,Los Angeles,CA,90026-4317
Strohm,Shelley,Los Angeles,CA,90025-3087
Ramirez,Joseph,Santa Monica,CA,90404-3119
Menendez,Daniella,Santa Cruz,CA,95060-2611
Tiarks,Daniel,Los Angeles,CA,90046-7127
Lima,Cindy,Larkspur,CA,94939-2119

Rosenberg, Amanda, Oakland, CA, 94606-1535
Mesick, Carl, El Dorado, CA, 95623-4817
Ridolfi, Miguel, Boonville, CA, 95415-0836
Bergers, Hanna, Albany, CA, 94706-1427
Wegscheider, Frank, Placentia, CA, 92870-5213
Rolbeck, Mike, Placerville, CA, 95667-7702
Edwards-Spitzer, Cynthia, Canyon Country, CA, 91387-1952
Taylor, Walter, Lompoc, CA, 93436-2914
Klein, Alan, Citrus Heights, CA, 95621
Ortega, Victor J, Windsor, CA, 95492-8012
Van Slyke, Rosemary, Chatsworth, CA, 91311-1634
Kocher, Sharon, Sebastopol, CA, 95472-6411
Elijah, Anaundda, San Luis Obispo, CA, 93401-7942
Pezzella-Ianoale, Delia, Carlsbad, CA, 92009-6314
Ziman, Pavol, Lubina, CA, 91612
Hall-Whitney, Suzy, Martinez, CA, 94553-5035
Garcia, Shana, San Dimas, CA, 91773-7115
Kaluza, N, El Sobrante, CA, 94803-3857
Ruiz, Louis Manuel, Santa Cruz, CA, 95062-2021
Russell, Patrick, Oakland, CA, 94618
Piotrowski, Karen, Fairfield, CA, 94533-7772
Stannard, Barbara, Sacramento, CA, 95835-1238
Sakr, Renee, Costa Mesa, CA, 92626-4435
Van Straalen, John, Petaluma, CA, 94952-2752
Covell, Sandi, San Francisco, CA, 94112-1401
Soraghan, Conor, San Diego, CA, 92107-2336
Wheeler, Frank, Travis Afb, CA, 94535-0551
Webster, Dennis, Costa Mesa, CA, 92627-6722
newquist, robin, Pasadena, CA, 91105-3438
Veney, Julie, Scotts Valley, CA, 95066-2827
Johnson, Delton, Santa Paula, CA, 93060-1627
Konar, Deborah, Oakland, CA, 94618-1053
Nunez, Marci, Castro Valley, CA, 94546-4135
Gaya, Alexander, Palo Alto, CA, 94303-2813
Sullivan, Darin, Santa Barbara, CA, 93105-4092
DeLuisa, Laura, Toluca Lake, CA, 91602-2560
Sandoval, Lily, Pasadena, CA, 91101-4687
Harding, Thomas, Altadena, CA, 91001-1940
Grano, Karen, Antioch, CA, 94509
Louis, Joanna, Encinitas, CA, 92024-1151
Bolman, Diane, Novato, CA, 94949-5598
eisel, chris, Torrance, CA, 90504-4521
Kirschbaum, Saran, Los Angeles, CA, 90035-4110
SCHULTZ, GARY, San Ramon, CA, 94583-0412
Golembiewski, Mark, Pacifica, CA, 94044-3845
Whipperman, Barbara, Richmond, CA, 94805-1211
Monks, Genevieve, Fairfield, CA, 94534-1848
dicks, carol, Redwood Valley, CA, 95470-9764

Phelps,Margaret,Los Angeles,CA,90024-6183
B.,Jill,San Francisco,CA,94109-1247
Rosenblood,Jamie,Los Angeles,CA,90049-5214
Herschler,Faith,Stanton,CA,90680-4233
Robinson,Kate,Anaheim,CA,92801-3203
Jones,Lynne,Lake Forest,CA,92630-4716
Singh-Bowman,Nan,Ben Lomond,CA,95005-9213
Trask,June,Oroville,CA,95966-8045
O'Connor,Richard,Walnut Creek,CA,94598-4915
Nystrom,Barbra,Diablo,CA,94528-0709
mittig,william,Mariposa,CA,95338-8701
Hambright,Currie,Carlsbad,CA,92009
Fronce,Linnea,Sacramento,CA,95822-1712
Torell,ERICA,Mill Valley,CA,94941-3655
Taffet,Linda,Dana Point,CA,92629-2202
Saul,Suzanne,Oakland,CA,94619-2402
Smith,Sheila,Salinas,CA,93907-8817
Roberts,Francis,Eureka,CA,95501-0522
Lerner,B.,San Jose,CA,95125-5524
Pessis,Andre,Corte Madera,CA,94925-1314
Leske,Jim,North Hollywood,CA,91606-2729
Shapiro,IRVING,Cypress,CA,90630-3052
Fox,Janie,Alameda,CA,94501-3717
White,Susan,Reseda,CA,91335-4643
Dufau,Pat,San Clemente,CA,92673-5669
Tweed,Victor,Long Beach,CA,90808-3353
Shank,Mindi,Santa Monica,CA,90405-2913
Budde,Sharon,Concord,CA,94521-5005
Musick,Doug,Walnut Creek,CA,94597-7570
Holzinger,Walter,Porter Ranch,CA,91326-4010
Kelly,Nancy P.,Oakland,CA,94605-1177
De Hart,Jane S.,Santa Barbara,CA,93108-1825
Strindberg,Samantha,Carmel Valley,CA,93924-9733
Soto,Robert,La Quinta,CA,92253-6113
Hoy,Julie,Pasadena,CA,91106-2120
Fukunaga,Judy,Arroyo Grande,CA,93421-1206
Camin,Darin,Clovis,CA,93611-3941
Grigg,Melody,Santa Maria,CA,93455-3129
Spencer,Gayle,Menlo Park,CA,94025-6315
Taylor,William,Mountain View,CA,94041-1942
okeeffe,anna,Sherman Oaks,CA,91423-5571
Vortman,Roger,Santa Cruz,CA,95060-6329
Todd,Bill,Citrus Heights,CA,95621-1660
Margo,Kirk,North Hollywood,CA,91601-4532
Forrester,Carole,San Luis Obispo,CA,93401-2509
hanson,sally,San Mateo,CA,94403-3665
Doolittle,Anne Marie,Potter Valley,CA,95469-9701
McCullough,Megan,Oak View,CA,93022-9329

Baker,Douglas,Vallejo,CA,94590-6125
Pomies,Jackie,San Francisco,CA,94122-1334
Olsen,Maedie,Los Angeles,CA,90068-3412
Barlow,Scott,Sunnyvale,CA,94087-4456
Palladine,Michelle,Palm Springs,CA,92262-6620
Forbes,Nancy,Rancho Palos Verdes,CA,90275-4463
Kippes,Althea,San Francisco,CA,94109-4221
Kerr,Alexis,Gilroy,CA,95021-0755
Hermann,Birgit,San Francisco,CA,94117-2594
Faber,Phyllis,Mill Valley,CA,94941-2971
Frazee,Cary,Eureka,CA,95503-9592
Ehemann,June,Duarte,CA,91010-3225
Van Iderstine,Nancy,Van Nuys,CA,91409-8288
Cavanaugh,Robert,Temecula,CA,92592-9397
Toro,Euripides,Los Angeles,CA,90041-3420
Siders,Jo,Murphys,CA,95247-9736
Banghart,Thomas,Valley Village,CA,91601-3631
Skelton,Irma,Mountain View,CA,94040-3609
Ditzler,M. Susan,Carmel,CA,93923-8204
Eckholm,Janet,Los Angeles,CA,90046-1236
Phillips,Regina,Winnetka,CA,91306-3264
Quiggle,Dexter,Woodland,CA,95695-6827
Bormann,Diana,San Fernando,CA,91340-1203
Arquilla,Vnce,Los Angeles,CA,90066
McPeak,Cynthia,Point Arena,CA,95468-0752
Siebert,simone,Cardiff,CA,92007-2002
raffetto,christine,Healdsburg,CA,95448-0925
Crosby,Ernest,Orinda,CA,94563-2591
Yellis,Stefanie,Oakland,CA,94619-2209
Littrell,Shannon,Carlsbad,CA,92008-1888
Childers,Deborah,Turlock,CA,95382-3200
Locke,Christina,Simi Valley,CA,93063-3510
Favalora,Suzanne,Laguna Niguel,CA,92677-1543
Cliver,Frederick,Long Beach,CA,90815-2041
Steudle,Robin,Laguna Woods,CA,92637-2765
BUDD,GEORGE,Los Angeles,CA,90035-3506
Trowsdale,Gavin,Palm Springs,CA,92262-5335
Scott,Frank R,Santa Ana,CA,92706-3115
Falls,Richard,San Francisco,CA,94132-2316
Mascarenas,Alfonso,Berkeley,CA,94704-1026
Watts,Anne,Santa Rosa,CA,95401-4911
Greensfield,Zvika,San Rafael,CA,94903-1562
Damero,Marlin,Los Angeles,CA,90004-2918
Cannon,Jean,Palo Cedro,CA,96073-0426
McCombs,Robert,Bayside,CA,95524-9333
Phillips,Kyla,San Jose,CA,95124-4711
Pena,Suzanne,Fullerton,CA,92835-3012
Ortiz,Ahmed,Sacramento,CA,95818-2129

Varon,Gil,Santa Barbara,CA,93101-3210
Weiner,J Bonsal,San Anselmo,CA,94960-2845
Mochel,Robin,Salinas,CA,93907-1602
Schrock,Renata,Torrance,CA,90503-2925
Besancon,Maureen,Nevada City,CA,95959-9602
McMullen,Marilyn,Vallejo,CA,94591-6929
Dinger,L,Rocklin,CA,95677-4786
Sanchez,Juanita,Riverside,CA,92501-2716
Baum,Miriam,Alta Loma,CA,91701-3111
Ehrlich,Annette,Los Angeles,CA,90068-3376
Fallandy,Yvette,Santa Rosa,CA,95404-8544
Dickinson,Susan,San Jose,CA,95119-1525
Buckley,James,Morgan Hill,CA,95037-3448
Crist,Jane,Pacific Palisades,CA,90272-2425
Auelua _,Tupefaavae,Victorville,CA,92392-8004
Draper,myinka,Los Angeles,CA,90042-1243
Woods,Ingrid,Mill Valley,CA,94941-1519
Guenther,Craig,Lakeport,CA,95453-3834
Fowler,John,Santa Monica,CA,90405-2321
Dunlevy,Patrick,San Pedro,CA,90732-4128
Weil,Helene,San Jose,CA,95125-2918
Bearden,Jim,Arnold,CA,95223-4112
Vonhoetendorff,Ty,Canoga Park,CA,91303-1033
cocks,reece,Citrus Heights,CA,95610-3138
Zera,Steve,Vista,CA,92081-5477
Emmer,Matthew,Sherman Oaks,CA,91423-4048
Williams,Paul,Angwin,CA,94508-9601
Shiels,Theresa,El Granada,CA,94018
Merkel,Karynn,Eureka,CA,95503-5402
Basile Jr,Mark,Gardena,CA,90249-3670
Brazil,Brenda,Cloverdale,CA,95425-3168
Vignassa,Doreen,Ventura,CA,93001-2360
Bill,Eileen,Santa Rosa,CA,95404-5972
Henley,Charlene,San Jose,CA,95136-3608
Acebo,Ryan,Oakland,CA,94602-3444
Frias,Nanette`,Garden Grove,CA,92845-1041
Frey,John,Redwood Valley,CA,95470-6135
Todd,Zachary,Brea,CA,92823-1054
Meyer,Ronald,Thousand Oaks,CA,91360-3558
Perry,Robin,Oakland,CA,94602-1853
luff,david,ven,CA,93003
CHUNG,SCOTT,Los Angeles,CA,90006-2245
Jacobs,Norma,Carmichael,CA,95608-1524
Azizkhanian,Artur,Burbank,CA,91504-1047
bloisi,regina,Mountain View,CA,94043-3764
Aiken,Achilles,Whittier,CA,90601-2102
Szabo,Joseph,Los Angeles,CA,90045-4332
Davison,Alexandra,Middletown,CA,95461-9526

McFarland,Mitch,Point Arena,CA,95468-8812
Aguirre,Gloria,Castaic,CA,91384-2518
Ramirez,Christina,San Diego,CA,92104-4652
Licari,L.,Fullerton,CA,92833-2439
Feierabend,Marla,Santa Barbara,CA,93109-1835
Padilla,Gustavo,San Diego,CA,92117-2940
Ruggiero,Dianna,San Diego,CA,92120-4629
Young,Jo Ellen,Culver City,CA,90230-4113
Mueller,Karsten,Santa Cruz,CA,95060-1766
scott,jerry,Jackson,CA,95642-9417
Sullivan,Teresa,Los Angeles,CA,90065-1727
FRUTH,SHELLEY,Lompoc,CA,93436-7058
Gx,Perry,Tustin,CA,92780-7011
Hill,Misako,Emeryville,CA,94608-3327
Rodrigues,Sharon,Fremont,CA,94539-3738
Kirk,John,Santa Barbara,CA,93109-1978
Fitzsimons,Raymond,Alameda,CA,94501-5236
Schlam,Steven,San Diego,CA,92104-4145
Truscott,Rosie,San Diego,CA,92126-4723
Taylor,Donald,Fair Oaks,CA,95628-6411
Harvey,Kurt,Hayward,CA,94544-7005
Hurst,Mark,Orinda,CA,94563-3922
Leviton,Peggy,Mckinleyville,CA,95519-9435
Higgins,Dh,Berkeley,CA,94709
Cretser,Cathy,Vacaville,CA,95688-9639
Angvick,Joanne,Pleasanton,CA,94588-4173
Capra,Maureen,Porter Ranch,CA,91326-1136
Krausz,Lisa,Tiburon,CA,94920-1344
Gardner,William,Forest Ranch,CA,95942-0216
Alzaga,Roxanne,Covina,CA,91722-1561
Scott,Heidi,San Rafael,CA,94903
Waddell,Julie,San Diego,CA,92131-4750
Johnson,Matthew,Anaheim,CA,92801-1327
Boone,Yvonne,Rialto,CA,92377-4579
DuVall,Elizabeth,Glendale,CA,91207-1228
Fleming,Steve,Gualala,CA,95445
Baker,Arlene,Berkeley,CA,94704-2848
Yvanova,Tsvetana,Woodland Hills,CA,91365-7229
Rowell,John,Los Gatos,CA,95032-5106
Gould,Catherine,Oak View,CA,93022-9706
Verschuur,Joanneke,Oakland,CA,94619-3335
Finer,Rick,La Quinta,CA,92253-8232
Younger,Lyn,San Jose,CA,95111-3810
Knight,Chetana,Palo Alto,CA,94306-3533
Sperry,Russell,Ventura,CA,93003-0218
pimentel,jeanne,San Pedro,CA,90731-6703
Vaughn-Dotta,Randy,Fresno,CA,93710-6413
Beebe,Margaret,Lompoc,CA,93436-1214

Perry,P,Hidden Valley Lake,CA,95467-8826
Ridgway,Nelson,Modesto,CA,95350-3942
Benda,Hilarey,Los Angeles,CA,90035-1418
Tagudar,Donna,Fontana,CA,92336-3837
Jones,Richard,San Diego,CA,92130-2463
Davis,Diana,San Anselmo,CA,94960-2113
Mammon,Robert,Richmond,CA,94803-3866
Bell,Rolland,Canyon Country,CA,91387-4336
Bodger,Walter,Whittier,CA,90601-5416
Trapp,Gene,Davis,CA,95616-6619
Dadgari,Joseph,Los Angeles,CA,90049-8205
Beyer,Janice,Stockton,CA,95203-1629
Tessmer,Fran,San Diego,CA,92122-3427
thiele,beverly,Kensington,CA,94708-1152
Austin,Carl,Garden Valley,CA,95633-0536
Sheets,Gabriel,Merced,CA,95341-5261
Wells,Eric,San Francisco,CA,94134-2106
Raye,Joyce,Salinas,CA,93908-9336
Miller,Christin,Los Angeles,CA,90049-1230
Crahan,John,Los Angeles,CA,90045-3731
Snow,Tower,Napa,CA,94558-9777
Salazar,Lawrence,San Diego,CA,92106-2532
Bailey-Halterman,LaVonne,San Diego,CA,92154-2859
Lane,Lama,Costa Mesa,CA,92627-7140
Walker,John,San Diego,CA,92104-2140
Kerr,Heather,San Jose,CA,95120-3701
Avina,Emma,Long Beach,CA,90803-7704
Mills,Michael,San Francisco,CA,94115-4509
Gallin,kay,Los Angeles,CA,90064-2680
Longhouse,Sweet Grass,Berkeley,CA,94703-2442
O'Hara,Sharon,Paradise,CA,95969-3126
Polesky,Alice,San Francisco,CA,94107-2644
Eisenbeg,Joel,Richmond,CA,94805-1135
Webman,Beverly,Santa Monica,CA,90405-5433
Mccarthy,Kerry,Chico,CA,95926-1064
Nannes,Lynda,Redondo Beach,CA,90278-1916
Goldsmith,Matthew,Los Angeles,CA,90046-4051
walsh,Wendy,Canoga Park,CA,91304-4633
Hydeman,Jinx,Trabuco Canyon,CA,92679-1108
Sparks,Claudia,Pittsburg,CA,94565-7625
Maxfield,Casee,Los Angeles,CA,90028-8647
Weigel,Alice,Watsonville,CA,95076-3067
Taylor,Jeremy,Fairfield,CA,94533-4032
Dollar,Robert,Sonoma,CA,95476-5966
Stallone,John,San Jose,CA,95125-3833
Fodge,Doris,Sacramento,CA,95827-3714
Bohac,Stephen,Twain Harte,CA,95383-1730
Paolini,Jessica,San Jose,CA,95118-3712

Goodrich,Cathy,Verdugo City,CA,91046-1002
Kiely,LaVive,San Francisco,CA,94127-1409
Jacobson,Brian,West Hills,CA,91307-5283
Merrill,James,Oxnard,CA,93033-7965
Root,Jessie,Oceanside,CA,92054-3748
Zecca,Christine,Sausalito,CA,94965-2521
Riveroll,Benita,San Diego,CA,92105-4828
Kurtz,Kenneth,Carlsbad,CA,92008-4623
Yamane,Yuri,Walnut,CA,91789-1601
Weikel,Wendy,Berkeley,CA,94707-2526
McLennan,Miles,Santa Barbara,CA,93111-1035
Greer,Lance,La Jolla,CA,92037-7667
Balch,Earl,San Diego,CA,92109-8249
Steinfeld,Naomi,Long Beach,CA,90815-3941
Rapoport,Cary,Hermosa Beach,CA,90254-2247
Stevens,Sarah,Martinez,CA,94553-3592
Montera,Alison,San Diego,CA,92128-4734
Ferry,Richard,San Jose,CA,95112-1911
Wenger,Donald,El Cajon,CA,92021-1815
Jaffe,David,Newport Beach,CA,92663-1604
legere,bill,Clovis,CA,93611-3401
Moidja,Nick,Gold River,CA,95670-8108
Fusco,Carol,Berkeley,CA,94708-2058
Lopez,Ralph,Los Angeles,CA,90012-5017
Rous,Dr. Pocholo,Burbank,CA,91504-4029
lennon,jim,Arcata,CA,95521-5332
Jaffee,Mark,Santa Cruz,CA,95060-2043
Mahdizadeh,Mojgan,Santa Clara,CA,95054-4166
Jacoabson,Laura,Walnut Creek,CA,94595-2636
Hawkins,Shereen,Huntington Beach,CA,92648-1423
SANIN,MARGARITA,Palmdale,CA,93550-6563
Pluta,Joseph,Bakersfield,CA,93301-4931
McMahon,Devin,Stanford,CA,94305-7486
Jones,Dan,Alameda,CA,94501-1120
Quadros,John,Fremont,CA,94539-7656
Hunter,Venus,Temecula,CA,92591-4704
Gottberg,Dorothy,Sacramento,CA,95829-1519
Payne,Jewel,Davis,CA,95616-3044
miguel,marcelo,San Diego,CA,92109-3503
Campa,Anna,Hayward,CA,94541-2382
Murray,Ian,Santa Rosa,CA,95405
Gray,David,San Diego,CA,92101-1364
Dunnigan,David,Pacific Grove,CA,93950-2223
Aguirre-Dutton,Veronica,Carpinteria,CA,93013-1857
Skei,Ingrid,Thousand Oaks,CA,91362-1811
Jensen,Wes,Chico,CA,95928-5920
Alfaro,Elaine,Felton,CA,95018-9637
Cochran,Wilburn,Ventura,CA,93001-2464

Perry,Anthony,Santa Clara,CA,95050-4376
cerny,lance,Petaluma,CA,94952-7316
Dennison,Brett,Garden Grove,CA,92840-6041
Zuniga,Arleen,Guerneville,CA,95446-8937
Yann-Ly,Chhay,Brea,CA,92821-2741
Thomas,Jane,San Luis Obispo,CA,93401-7640
Insprucker,Lou,La Canada Flintridge,CA,91011-2627
Cannon,Carole,Rocklin,CA,95677-4213
Levy,Elizabeth,Richmond,CA,94805-1136
Borean,Les,Torrance,CA,90505
Larson,Elaine,Petaluma,CA,94954-1588
Mackey,Claudia,Stockton,CA,95207-5357
Winterling,Theresa,Atherton,CA,94027-3843
Behar,Victoria,Thousand Oaks,CA,91360-7038
Brace,Jennifer,Pearblossom,CA,93553
McDonald,Mary Ann,Sacramento,CA,95818-3252
Williams,Roz,Santa Clarita,CA,91355
Rodarte,MaryKay,Phelan,CA,92371-6430
Juchert,Wally,Santa Rosa,CA,95409-6218
Hellwig,Karen,Los Angeles,CA,90056-1737
Herrero,Pablo,Laguna Niguel,CA,92677-3701
Hunter,Michael,Woodacre,CA,94973-0696
Bettosini,Nick,Beaumont,CA,92223-8647
Scott,Chris,Santa Maria,CA,93458-1021
Estes,Douglas,San Francisco,CA,94118-4063
Aderhold,Steven,Fallbrook,CA,92088-1135
Sheets,Sarah,Merced,CA,95341-5261
Hall,Stacy,San Diego,CA,92104-2926
carrier,linda,San Francisco,CA,94117-4419
Motter,Marcina,Encinitas,CA,92024-1305
Morris,Keith,Los Angeles,CA,90027-5520
Lebow,Roger,Sierra Madre,CA,91024-2053
Michalik,Joanne,San Diego,CA,92128-1546
Moss,Robert,Palo Alto,CA,94306-3136
Creighton,Andrew,Los Angeles,CA,90032-2928
Owczarz,Linda,Oakland,CA,94605-1706
McCoy,Lily,Lakewood,CA,90713-1611
Zahrobsky,Suzanne,Greenwood,CA,95635-9209
Aguilera,Marco,Carlsbad,CA,92008-2239
Ra,Mabel,Yorba Linda,CA,92887-3957
Pluchon,Joelle,Beverly Hills,CA,90211-1621
Mills,Michael,Sierra Madre,CA,91025-0037
Stoglin,Krystal,Oakley,CA,94561-4601
Howard,Mark,Berry Creek,CA,95916-9759
Shibuya,Whitney,Santa Clarita,CA,91350-1773
Ingoglia,Charles,Mountain View,CA,94043-4965
Hay,Thomas,Rio Linda,CA,95673-3252
Ross,M,San Rafael,CA,94901-1834

Strailey, Faith, Quincy, CA, 95971-3012
Bernstein, Adam, Los Angeles, CA, 90012-2581
Houck, Cyndi, Santa Rosa, CA, 95405-4747
Shelton, Helen, Apple Valley, CA, 92307-5409
Beck, Kristen, Monterey, CA, 93940-3648
Wilder, Cynthia, Rancho Palos Verdes, CA, 90275-3039
Davis, Diane, Crestline, CA, 92325-0494
Kent, Ian, Kirkwood, CA, 95646
veraldi, anne, San Francisco, CA, 94110-1688
Leonard, Michael, La Jolla, CA, 92038-0654
Cohen, Eileen, Berkeley, CA, 94702-1948
Williams, Joanna, Berkeley, CA, 94705-1917
Wolf, Robert, Brentwood, CA, 94513-6905
"Wright, MD", Lara, Albany, CA, 94706-2343
Gentle, Roslyn, Studio City, CA, 91604-2083
Roman, Rolando, Panorama City, CA, 91402-1014
Egger, Rebecca, Berkeley, CA, 94705-2739
Mews, Bruce, San Jose, CA, 95123-4912
Johnson, Kyle, San Francisco, CA, 94114-2337
Yelmen, Doug, Lompoc, CA, 93436-1231
Adams, Paula, Pasadena, CA, 91107
MacKinnon, Alethea, Oakhurst, CA, 93644-9513
Kabbinahally, Sujit, Fountain Vly, CA, 92708-2562
Figueroa, Daphne, San Diego, CA, 92107-2723
Mari, Natalie, Davis, CA, 95618-6013
Jammal, Anthony, Roseville, CA, 95661-5968
Hughes, Maggie, Berkeley, CA, 94704-2247
Hardy, Kathryn, Petaluma, CA, 94952-2280
Moore, Malcy, Portola, CA, 96122-8210
Johnson, Alvin, Broderick, CA, 95605-2739
Nielson, Richard, Los Osos, CA, 93402-3301
Reyes, Francisco, Turlock, CA, 95382-1216
Owen, Sheila, Huntington Beach, CA, 92648
Perinchief, Jana, Sacramento, CA, 95821-3402
Jackson, Jordan, Palo Alto, CA, 94301-2740
Gagomiro, Keith, Sacramento, CA, 95814-1305
Martin, Glenn H., San Francisco, CA, 94110-3315
Hargraves, Mark, Sebastopol, CA, 95472-9602
Goldberg, Heather, Redwood Estates, CA, 95044-0566
Burch, K, Oakhurst, CA, 93644-3496
Voss, Joe, Oceanside, CA, 92056-7240
conniff, yuko, Los Angeles, CA, 90036-4061
Vampotic, Randy, Whittier, CA, 90601-2426
Duarte, Nicol, Mira Loma, CA, 91752-2821
ziegler, herbert c, Yucaipa, CA, 92399-4612
Thomas, Robert, Fremont, CA, 94539-6051
Cheesman, Jean, Santa Barbara, CA, 93103-2127
rodriguez, doris, Lake Forest, CA, 92630-7245

Carrara,Diane,San Francisco,CA,94110-5835
Hamilton,Frederick,Rancho Cucamonga,CA,91739-1925
Covey,Susan,Palo Alto,CA,94306-3150
Falconer,Jay,Long Beach,CA,90802-1435
Green,Michael,Pleasanton,CA,94588-3560
Kraus,Gary,Playa Del Rey,CA,90293-8696
Nisperos,Stacy,Fullerton,CA,92833-3449
Notary,Kimberly,Modesto,CA,95350-5860
Nunez,Stephanie,Van Nuys,CA,91405-3142
Kulkovit,Kimberly,Los Angeles,CA,90011-1509
Kean,Martha,City,CA,94526
Meyer,Oliver,South San Francisco,CA,94080-4134
Wright,Steve,Sunnyvale,CA,94089-5847
Leino,Anna,San Francisco,CA,94127-2343
Diehl,William,Simi Valley,CA,93063-4740
Olander,Shirley,Sonoma,CA,95476-0606
Augur,Wayland,Newport Beach,CA,92661-1422
Ranz,Lauren,Lafayette,CA,94549-6243
Aenlle,William,Altadena,CA,91001-3055
samson,patricia,Eureka,CA,95503-6929
Miskulin,Shannon,Ventura,CA,93002-4201
Lieblich,Richard,San Ramon,CA,94583-2525
Saunders,Chad,Albany,CA,94706-1225
Robles,Arthur,Chula Vista,CA,91913-1600
Hanger,Susan,Topanga,CA,90290-3551
Alma,Emily,Chico,CA,95928-7101
Plimier,Maureen,Oakland,CA,94605-3885
Delaney,Patrick,Stockton,CA,95204-4511
Campisi,Vincent,Canyon Country,CA,91387-1851
Lotz,Jude,Burbank,CA,91505-1607
Kooiman,Cornelius,Encinitas,CA,92024-4500
Macias,Sherry,Sacramento,CA,95825-6610
Jones-Bunn,Shawn,Avila Beach,CA,93424
Blockstein,Susan,San Mateo,CA,94402-3306
Jung,Scott,South Pasadena,CA,91030-4134
Humrich,Aidan,Rohnert Park,CA,94928-3939
Arrivee,David,Arroyo Grande,CA,93420-3753
Poggi,Pietro,San Rafael,CA,94901-2846
Lekovish,Thu,San Leandro,CA,94577-3817
Roberts,Terri,Los Angeles,CA,90068-3103
Salazar,Jose Luis,Santa Paula,CA,93060-2453
kaempfe,janis,San Francisco,CA,94133-2953
Margiotta,Joe,Kernville,CA,93238-0135
Vogel,Janny,Oceanside,CA,92057
Russo,Dennis,Newport Beach,CA,92660-4739
Eichelberger,Nancy,Culver City,CA,90230
McIntire,Riley,Los Angeles,CA,90042-1039
Romani,Gwen,Castaic,CA,91384-4311

Sharpe, Charles, Bayside, CA, 95524-9301
Royer, Andrew, Shasta Lake, CA, 96019-9247
Drager, Luranne, San Francisco, CA, 94122-2728
Broussard, Kelly, Porter Ranch, CA, 91326-4587
Glover, Amanda, Venice, CA, 90291-3927
Maslin, Cheryl, Alameda, CA, 94501-7452
Patterson, Judith, Los Angeles, CA, 90035-2606
Rothenberger, Elisabeth, Novato, CA, 94949-5945
Rogers, Chris, Reseda, CA, 90023
baskin, dawn, Sebastopol, CA, 95472-3147
Keller, Vivian, Red Bluff, CA, 96080-8331
Matelski, Lauren, Woodland, CA, 95695-5605
Coons, Gregory, South San Francisco, CA, 94080-1318
Goldstein, Barbara, Los Angeles, CA, 90064-3824
shah, nip, San Diego, CA, 92129-3025
Wilson, Sandra, Clayton, CA, 94517-9767
Fitzpatrick, Tom, West Hollywood, CA, 90048-2564
Herndobler, Beth, Altadena, CA, 91001-4209
Valdick, Sabra, Mill Valley, CA, 94941-3918
Murphy, Dannah, Capo Beach, CA, 92624-1337
Costello, Kate, Los Angeles, CA, 90065-2437
George, Bryan, Rancho Cucamonga, CA, 91737-3822
Waldrip, Steven, Aptos, CA, 95003-3916
Koivisto, Ellen, San Francisco, CA, 94122-2856
Ireland, Ilona, Sacramento, CA, 95833-1475
Morikawa, Matthew, Santa Rosa, CA, 95405-6810
Melin, Ron, Torrance, CA, 90503-6938
Cabanban, Robert, Oakland, CA, 94605-1102
Deerlyjohnson, Suzanne, Long Beach, CA, 90806-4707
Serna, Edwin, Los Angeles, CA, 90011-2249
Downey, Carol, Carmichael, CA, 95608-4304
Rohrbaugh, Stacey, Willits, CA, 95490-8722
Beaton, Wendy, Ventura, CA, 93003-7564
Swihart, Steve, Walnut Creek, CA, 94595-1635
Goldthorpe, Jack, Novato, CA, 94945-1232
Seaton, Brock, Encino, CA, 91316-3402
Huddleston, Molly, Santa Rosa, CA, 95402-1119
Menzel, Sandra, Brookdale, CA, 95007
Dito, Kristin, Santa Rosa, CA, 95403-1662
Hill, Rodney, Grass Valley, CA, 95949-8333
Felix, Ashley, Riverside, CA, 92506-5654
Lux, Steven, Hawthorne, CA, 90250-8330
Zaman-Zade, Rena, Escondido, CA, 92027-3408
Schehl, Ed, Santa Cruz, CA, 95063-2123
Knight, Diane, West Hills, CA, 91307-2516
Cole, Ann, Nicasio, CA, 94946
Adams, Dennis, Napa, CA, 94558-3138
maes, kurt, Reedley, CA, 93654-3959

Gauthier,Luce,Los Angeles,CA,90016-1512
Eklof,Paul,Petaluma,CA,94952-2012
Aguiar,Vanessa,PORTUGAL,CA,95451
Moss,Marjorie,Del Mar,CA,92014-3823
Elliott,Ed,Ben Lomond,CA,95005-0145
Krakowsky,Arthur,Livermore,CA,94550-9615
Murray,Michelle,Chico,CA,95926-4054
Flynn,Erin,Woodland Hills,CA,91364-4541
Walkowiak,Mark,Burbank,CA,91506-1321
Schiffman,Lauren,El Cerrito,CA,94530-1331
Espanol,Karen,Culver City,CA,90230-4873
ragana,lollie,Santa Monica,CA,90405-5538
Marshall,Raymond,Foresthill,CA,95631-9201
Redgrave,Laura,Encino,CA,91316-1762
Buckley,Leo,San Francisco,CA,94110-1222
Caviglia,GL,Morgan Hill,CA,95038-1954
"Sullivan, MD",Robert,Sacramento,CA,95816-3426
Sampognaro,Kathy,morgan hill,CA,95037
Lara,David,Pleasant Hill,CA,94523-7319
Griswold,Dean,Fair Oaks,CA,95628-2929
Foltz,Mary,Livermore,CA,94551-1737
Telles,Doris,Mountain Center,CA,92561-0450
krick,shellie,Pleasant Hill,CA,94523-2980
Terry,Jane,Redwood City,CA,94062-1442
Naue,Judi,Manteca,CA,95337-4337
Valencia,Felicia,Riverside,CA,92508-6819
Ishii-Price,Rika,Alamo,CA,94507-2737
Joseph,Marc,San Mateo,CA,94402-3840
Shauinger,Lynn,San Francisco,CA,94117-2310
Brown,Bobbie,San Diego,CA,92114-2407
Wright,Susan,Palo Alto,CA,94306-1340
Thompson,Stephanie,Santa Ana,CA,92705-2405
Soderstrom,Janet,San Ramon,CA,94583-3018
Molina,Ruth,Temecula,CA,92592-3006
Desamours,Inesa,Sacramento,CA,95811-4105
VanVliet,Nagisa,Livermore,CA,94550-2534
Goodreau,Christine,Los Angeles,CA,90036-1945
Yates,Mary,Gilroy,CA,95020
Peterson,John,Temecula,CA,92592-3203
Puett,David,Fair Oaks,CA,95628-4413
Rawlings,Dorelle,Aptos,CA,95001-2174
Alessi,Carl,Yorba Linda,CA,92887-4750
Moon,Brandon,San Diego,CA,92122-2625
Maselli,Flavio,Laguna Hills,CA,92653-6262
Hiestand,Nancy,Davis,CA,95616-3523
parkins,april,Oakland,CA,94611-5115
Yamauchi,R.,Woodland Hills,CA,91364-4222
Zoah-Henderson,Richard,Eureka,CA,95503-6249

gordon,nancy,Cardiff By The Sea,CA,92007-1816
Speigel III,John,Riverside,CA,92507-7921
Enright,Mareka,Chatsworth,CA,91311-6435
Kosta,Yael,San Diego,CA,92111-7223
Krell-Bates,Diane,San Diego,CA,92122
Black,Meaghan,Hollister,CA,95023-4827
Von Huene,Roland,Diamond Springs,CA,95619-9489
Mello,Annette,Boulder Creek,CA,95006-9075
Wilson,Jim,Placerville,CA,95667-7915
Gales,Helen,La Jolla,CA,92037-6614
Slade,Daniel,San Francisco,CA,94102-1102
Rajan,Narayan,Los Altos,CA,94024-4137
Schwager,Richard,Santa Barbara,CA,93105-2140
McKnight,Shoshanah,Santa Cruz,CA,95062-1054
Soares,David,Pollock Pines,CA,95726-9424
Mercer,Noah,Los Angeles,CA,90027-2918
Martinez,Lisa,San Francisco,CA,94110-5403
Chen,Allan,Alameda,CA,94502-6575
Nichols,Lucy,Ventura,CA,93004-3150
Sasaki,Wynn,Scotts Valley,CA,95066-3914
Pinarelli,Antonio,Santee,CA,92071-2106
P,E,Talmage,CA,95481-0178
Parker,Tim,Chatsworth,CA,91311-2857
Gullo,Monte,Sacramento,CA,95815-2416
Masuda,Patricia,Fountain Valley,CA,92708-4608
Alexander,Susan,San Francisco,CA,94109-2254
Saitta,Martin,San Diego,CA,92115-1312
Gordon,Susanna,Oakland,CA,94610-1850
Root,Barbara,Merced,CA,95340-8353
Carey,William,Sherman Oaks,CA,91403-5055
Simonich,Claire,Half Moon Bay,CA,94019-5107
Emerson,Lawrence,National City,CA,91950-4121
Fong,Linda,Sacramento,CA,95831-2823
Sheridan,Lenore,Berkeley,CA,94703-1488
Archibald,Roberta,Morgan Hill,CA,95037-2929
Eurs II,Albert,Cypress,CA,90630-4604
Greenwald,Evelyn,San Luis Obispo,CA,93401-6026
Baier,Carol,San Diego,CA,92103-4603
Hudak,Lesley,Orinda,CA,94563-4131



Comment Log Display

BELOW IS THE COMMENT YOU SELECTED TO DISPLAY.

COMMENT 4 FOR CRUDE OIL AND NATURAL GAS FACILITIES REGULATION (OILANDGAS2016) - 45 DAY.

First Name: Christopher

Last Name: Lish

Email Address: lishchris@yahoo.com

Phone Number:

Affiliation:

Subject: Please quickly finalize strong methane safeguards

Comment:

Monday, July 18, 2016

Subject: Please quickly finalize strong methane safeguards --
 Notice of Public Hearing to consider the Proposed Regulation for
 Greenhouse Gas Emission Standards for Crude Oil and Natural Gas
 Facilities.

Dear California Air Resources Board Chair Nichols and fellow board
 members,

I'm writing to thank the Air Resources Board for developing
 critically important rules to address methane pollution from the
 oil and gas industry in California, and to urge the agency to
 quickly finalize these safeguards.

"Then I say the Earth belongs to each generation during its course,
 fully and in its own right, no generation can contract debts
 greater than may be paid during the course of its own existence."
 -- Thomas Jefferson

Full implementation of these new protections would make California
 a national leader in reining in out-of-control methane pollution
 from the oil and gas industry. The comprehensive scope of these
 rules--including addressing both new and existing sources, both
 onshore and offshore infrastructure, and setting monitoring
 standards for natural gas storage sites like Aliso Canyon--avoid
 many of the loopholes and weaknesses of other state and federal
 standards.

OP-4-1

"It is our task in our time and in our generation, to hand down undiminished to those who come after us, as was handed down to us by those who went before, the natural wealth and beauty which is ours."

-- John F. Kennedy

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

* Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

OP-4-2

* Do not exempt sources of methane such as low-bleed pneumatics;

OP-4-3

* Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

OP-4-4

"Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method."

-- Theodore Roosevelt

The massive, nearly four-month-long methane leak in Porter Ranch was a wakeup call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

OP-4-5

"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

-- Aldo Leopold

Thank you for your consideration of my comments. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,
Christopher Lish
San Rafael, CA

Attachment:

Original File Name:

Date and Time Comment Was Submitted: 2016-07-18 07:40:04

If you have any questions or comments please contact [Clerk of the Board](#) at (916) 322-5594.

[Board Comments Home](#)

The Center for Methane Emissions Solutions
Washington, DC

July 18, 2016

BY EMAIL via <http://www.arb.ca.gov/lispub/comm/bclist.php>

Clerk of the Board
California Air Resources Board

RE: The Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.

The Center for Methane Emissions Solutions (CMES) is a coalition within a non-profit organization that represents the views of companies in the methane mitigation industry in the United States, including the leak detection and repair (LDAR) space.

The methane mitigation industry is a robust and growing American industry. 72 companies have headquarters in the U.S., and there are approximately 570 methane mitigation facilities located across the country. These facilities are manufacturing plants, assembly facilities, service centers, service provider offices, and administrative offices.

In response to publication of the proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, CMES offers these thoughts to help the ARB produce a final rule that provides the most practical, economic, and effective structure to capture methane emissions that would otherwise be released into the atmosphere. Capturing these emissions both enhances the revenue lines of oil and gas producers because they can monetize natural gas that would otherwise be wasted and also slows the detrimental environmental damage done by a greenhouse gas 84 times more potent than carbon dioxide.

OP-5-1

Colorado's Regulation 7

By way of background, we should note that we have watched carefully the implementation of Colorado's Regulation 7, currently the most comprehensive set of methane waste regulations at the state level. No lawsuits have been filed to stop the implementation of the rule, and we are unaware of any significant effort to roll back the rule legislatively or at the regulatory level. In an effort to understand why implementation of such a rigorous regime has gone so smoothly, CMES recently published a study of the oil and gas industry's perceptions of the implementation of Colorado's Regulation 7. The study is attached to these comments as Exhibit A.

Of the ten oil and gas operators who sat for in-depth interviews, Keating Research found that these companies had themselves conducted more than 1,100 site inspections at facilities over the past year. On average, oil and gas companies found methane leaks on 9 out of 10 sites inspected. More importantly, oil and gas companies reported that implementing Colorado's rule was very cost

effective. When they took into account the natural gas they saved and sold because of their LDAR programs, 8 out of 10 said they had either profited, broken even, or paid just a little more under Colorado's regulation. And 7 of 10 said that the benefits of the regulation outweighed the costs.

Specific Available Technologies and an On-Ramp for Innovative Technologies to Come

We understand that individual companies and other trade associations focused on particular technologies will likely submit comments as to specific provisions in the proposed rule that could be improved, with the perspective that as the oil and gas industry finds more leaks, technology is readily available to repair those leaks extremely economically. We certainly believe such comments should be given careful consideration.

But we are very concerned that the proposed regulations do not contemplate the commercialization of new technologies which promise to dramatically reduce the cost of detection of methane leaks and promise to enhance the ability of the industry to measure leaks many fold. For example, the U.S. Department of Energy has funded research and development in 11 such companies under the ARPA-e Methane Monitor Program, and the successful companies in this program will be ready to go to market with their technologies within two to three years. We strongly believe that the new regulations should provide some process whereby these new commercial technologies are validated and are certified as useful to comply with the regulations. The U.S. EPA has provided for such an on-ramp in their final rule on new and modified sources of methane emissions in the oil and gas industry, and the Bureau of Land Management at the U.S. Department of the Interior has included such a process in their draft rule for new and existing sources on federal public lands.

OP-5-2

Method 21

One of the major flaws in the proposed regulations is the requirement that Method 21 be used to measure all leaks, in order to set the repair timetable for those leaks. That requirement will disincentivize the use of any other detection technology -- especially Optical Gas Imaging (OGI) technologies -- even though those detection technologies find leaks 15 times faster than Method 21 devices, find more leaks, find leaks in hard-to-reach areas for Method 21 devices, and are safer for oil and gas production workers to use. See the following case study of Jonah Energy's experience with OGI technology: <http://www.ogi.com/whitepapers/2016/05/optical-gas-imaging-at-jonah-energy-saving-gas-and-saving-money-through-regular-ogi-surveys.html>. Put simply, oil and gas producers will not likely pay for a second detection technology if they know they need to use Method 21 in all events any way.

OP-5-3

Forgoing these substantial benefits of OGI and alternative technologies in favor of Method 21 so that a repair timetable can be set seems particularly counter-productive, because the larger the leak, the more incentive an oil and gas producer will have to repair that leak faster, regardless of the regulations. The larger the leak, the more natural gas is wasted, and the greater the loss of revenue for the producer. Revenue to the bottom line will move the producer to repair the leak as fast, or maybe faster, than the regulations' timetable.

It is true that Method 21 does measure the leaks, whereas as some OGI technologies do not. But it is important to remember that some currently available technologies do in fact measure leaks (and

the chemical components of the leaks) and that research and development of technologies currently funded by the U.S. Department of Energy’s ARPA-e Monitor Program will produce commercially available methane measurement technologies that promise to be vastly more precise and cost-effective than Method 21 within two to three years. Thus, there is a strong probability that the proposed regulations will be outdated soon, requiring compliance with a much less precise technology.

So we would argue that on balance, the regulations should not forgo the benefits of OGI and other alternative technologies that are available now: the ability to find more leaks faster and technologies much safer for workers to use. Following Colorado’s example of not measuring the size of leaks but requiring all leaks – no matter what their size – to be repaired in 14 days will likely result in finding more leaks faster, and as study after study has found, roughly 9 out of 10 will be easily repaired in that period. We believe that removing the requirement that Method 21 always be employed will incentivize producers to use these alternative technologies and the result will be less methane released into the atmosphere than with the Method 21 requirement for the near term. As more cost-effective technologies with more precise measurement capabilities come to market, the regulations can be modified accordingly.

OP-5-3
cont.

Leak Detection and Repair

Our comments about the leak detection and repair sections of the proposed regulations are underwritten by several factual premises.

First, leaks are caused both by equipment failure and by operator error. In an exhaustive study of super-emitting leaks in the Barnett Shale region, the authors concluded that “equipment malfunctions and error-inducing workforce conditions are the most common causes of excess emissions related to avoidable operating conditions.” (Daniel Zavala-Araiza et al., “Toward a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites,” *Environmental Science & Technology*, page 8172.) Thus, leaks cannot be predicted based on the age or quality of the equipment, as operator error can render such equipment ineffective.

Second, while most of the leaks that occur are small, a minority of leaks are “super-emitters,” accounting for a disproportionate amount of methane emissions that could be avoided. A few leaks can account for 20% of the methane emissions in a particular region. (See David R. Lyon et al., “Constructing a Spatially Resolved a Methane Emission Inventory for the Barnett Shale Region,” *Environmental Science & Technology*, pages 8147-8155.) Because methane leaks cannot be seen or smelled by oil and gas workers, even these large super-emitting leaks can go completely undetected.

OP-5-4

Third, once detected, it is almost always economic for the producer to repair these leaks. Such was the conclusion of a Carbon Limits study of data from 4,293 surveys of oil and gas facilities in the U.S. and Canada published in 2014:

“The vast majority of leaks are economic to repair once identified: even assuming a low value of gas (3 USD per McF), leaks amounting to more than 97% of total leak emissions are worth repairing. In addition, over 90% are from leaks that can be repaired with a payback period of less than one year. This means that once the survey has been performed, it is economic to repair almost every leak, even at low gas prices.” (*Quantifying Cost-Effectiveness of*

These factual premises lead to the following conclusions regarding the proposed rule.

1. We heartily endorse the proposed regulations' requiring quarterly inspections, because:
 - a. super-emitters contribute disproportionately to methane emissions in any particular region;
 - b. without inspection an oil and gas producer cannot determine whether there exists a small or super-emitting leak;
 - c. such super-emitting leaks can be just as easily be produced by operator error as by an equipment failure;
 - d. the amount of methane released into the atmosphere by a super-emitting leaks can be enormous if such a leak goes undetected for up to six months;
 - e. quarterly inspections result in methane emissions reductions 50% higher than the reductions produced by annual inspections (See *Economic Analysis of Methane Emission Reduction Opportunities in the U.S. Onshore Oil and Natural Gas Industries*, ICF International, page 3-10);
 - f. the net present value of quarterly inspections (taking into account the natural gas not wasted if repaired quickly) is either neutral or, at worst case, only slightly negative (see Carbon Limits study, page 7); and
 - g. early results from Colorado's experience with requiring quarterly inspections suggests that quarterly inspections are either not a significant burden on oil and gas producers or a net positive, with early paybacks from recovering the otherwise waste natural gas.
2. The ARB should not predicate frequency of inspections on the number of leaks found in the immediate past; rather, the Colorado regime for inspection frequency is more appropriate. There are two reasons for this:
 - a. First, given that one of the causes of leaks is operator error, worker maintenance and operating mistakes can occur randomly and trigger leaks from otherwise the most effective components. And those errors may also cause large, super-emitting leaks. Past performance in this case is not a good predictor of future outcomes.
 - b. Second, the incentives such a rule creates can be perverse. They may motivate producers not to find leaks and fix them, but rather to manage the detection and reporting of leaks to come within certain component percentage thresholds. Such a rule would divert producers from the main goals of the rule itself.

OP-5-4
cont.

OP-5-5

3. The ARB should reconsider the provisions in paragraph 95699(o) that prohibit leaks at any facility over a certain number or should clarify what will be the enforcement protocol for violations of this subparagraph. Remember that leaks, and large ones in particular, cannot always be predicted and have a random dimension, often due to operator error. It would seem that the goal should be to reduce the frequency of leaks and the fast repair of those leaks when they are found. The regulations' requirements of regular quarterly inspections of facilities and components advances the goal, and perhaps some certification by producers that they have in place rigorous worker training programs would be similarly helpful. But to unduly penalize producers for exceeding a certain number of leaks within a time period when the offending leak is caused by a single worker's failure to adequately close a hatch, seems counter-productive. It may incentivize operators to hide the excessive leak and avoid repair of the leak for some period of time, which is precisely not the result the regulations are trying to achieve.

OP-5-5
cont.

Centrifugal Compressors

We generally support the language in the proposed regulations regarding centrifugal compressors and their focus on wet seals that fail. In particular, we agree with the provisions of subparagraph 95668(e)(7), highlighting the value of retrofitting from a wet oil seal to a dry seal. It is true that the switch to dry gas seal is not technically feasible in all circumstances, but in many instances, the use of dry gas seal technology for centrifugal compressors is technically, environmentally and economically the most viable option. Dry gas compressor seals are installed with a control system that monitors the performance, health and emissions of the shaft seal. These control systems are integrated with the facilities digital monitoring systems allowing access to the data required to meet the reporting requirements of state and federal regulations.

We should note that the Fluid Seals Association (FSA) has developed a *life cycle cost calculator* tool for centrifugal compressors to analyze the relative merits of the various options and will make the tool available to help determine what might be the Best System of Emission Reduction. It takes into consideration the annual operating costs including maintenance costs, the value of leaked gas, consumables, the cost of all the energy consumed and the cost of lost production resulting from seal failure which is quite considerable in wet seal systems. This comprehensive tool calculates, amongst other factors, the energy consumed from the seal and the support system, the compressed gas energy released, and the pipe friction from oil contamination. Taking into account one-time costs such as total retrofit costs, it calculates payback period, the present value of the annual operating costs over the lifespan remaining, and the total life cycle cost.

OP-5-6

The *life cycle cost calculator*, developed by FSA Mechanical Seal Division members can be tailored to local conditions for individual cases and thus can help our oil and gas customers confirm the economic and environmental value propositions between re-routing the gas, flaring, or retrofitting the centrifugal compressors with dry gas seal technology.

Submitted on behalf of the Center for Methane Emissions Solutions by:

Parich M Baur

Patrick Von Bargaen
Executive Director
patrick@methanesolutions.org

EXHIBIT A

From: Chris Keating, Keating Research, Inc.

Date: April 10, 2016

Re: ***The Colorado Case Study On Methane Emissions: Conversations With The Oil And Gas Industry***
Key Findings From Interviews With Representatives Of Companies That Are Conducting Site Inspections To Detect Methane Leaks At Oil and Gas Operations In Colorado

These key findings are based on 30 minute telephone interviews among 10 representatives of oil and gas companies and 3rd party suppliers that are conducting site inspections to detect methane gas leaks at oil and gas operations in Colorado as required under Colorado's Regulation 7. Interviews were conducted with representatives from larger oil and gas producers, smaller producers and leading companies in the third party service provider industry. These interviews were conducted on behalf of the Center For Methane Emissions Solutions by Keating Research from December 7, 2015 to January 31, 2016.

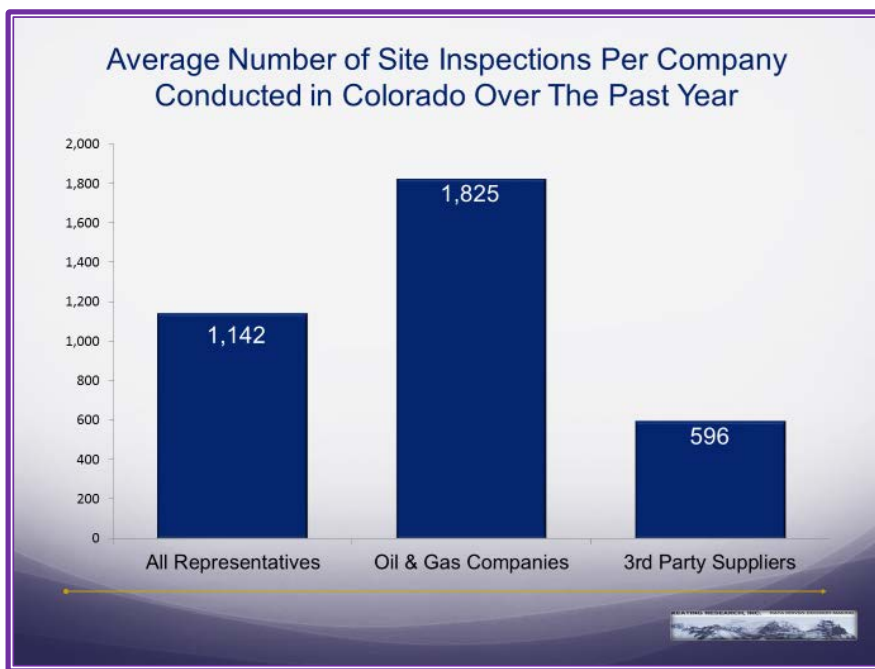
To complete these 10 interviews, Keating Research contacted 35 oil and gas companies in Colorado and invited each of them to be interviewed about their experience with Colorado's Regulation 7. Interviews were completed with representatives of all of the oil and gas companies that expressed a willingness to participate in this research.

Colorado oil and gas companies have conducted thousands of site inspections over the past year as required under Colorado's Regulation 7.

In fact, the companies interviewed here conducted more than 1,100 site inspections on average at their oil and gas operations in Colorado over the past year.¹

The inspections are working to help find methane leaks. When we ask representatives to tell us how many methane leaks they are finding during a *typical* site inspection, **they report finding 2 to 3 methane gas leaks on average, and they find at least one methane gas leak in 9-out-of-10 typical site inspections.**

As a result of these site inspections over the past year, these representatives tell us, on average,



¹ A site inspection is defined as when they go out to an area or property with oil and gas operations to do an inspection for methane gas leaks.

that their company found more than 800 methane leaks in Colorado.

The equipment most predominately used to detect these methane leaks during a site inspection is an *infrared gas imaging and detection camera*. Eight-of-ten representatives say they commonly use an infrared gas imaging and detection camera to detect leaks, while the remaining say they most often use a portable methane detector unit.

The infrared gas imaging camera does not allow the user to determine how much methane was leaking by volume, so representatives were unable to give us specifics on exactly how much methane was escaping from the leaks that they found.

Most of the methane leaks are described as small and easily fixed within a few days.

The vast majority (88%) of methane leaks that were found during site inspections over the past year are described as a small leaks, while about 1-in-10 are described as large, significant leaks.

In 9-of-10 cases the representatives agree that the cause of the leak is typically something simple such as an open valve or a loose connection or seal, while only 1-in-10 of the leaks are considered more problematic than that.

When it comes to fixing the leaks, if the repair is simple enough an attempt is made to make the repair right then on the spot, and **nearly all of the leaks are either *fixed right there on the spot* (30%) or *fixed within a few days* (66%).**

In fact, representatives indicate that a repair technician typically moves around with the team finding and repairing the methane leaks. Only a very small proportion of the leaks take longer than a few days to fix.

Representatives tell us that the small methane leaks are primarily found in *regulators / controllers, separators, valves and tank hatches*.

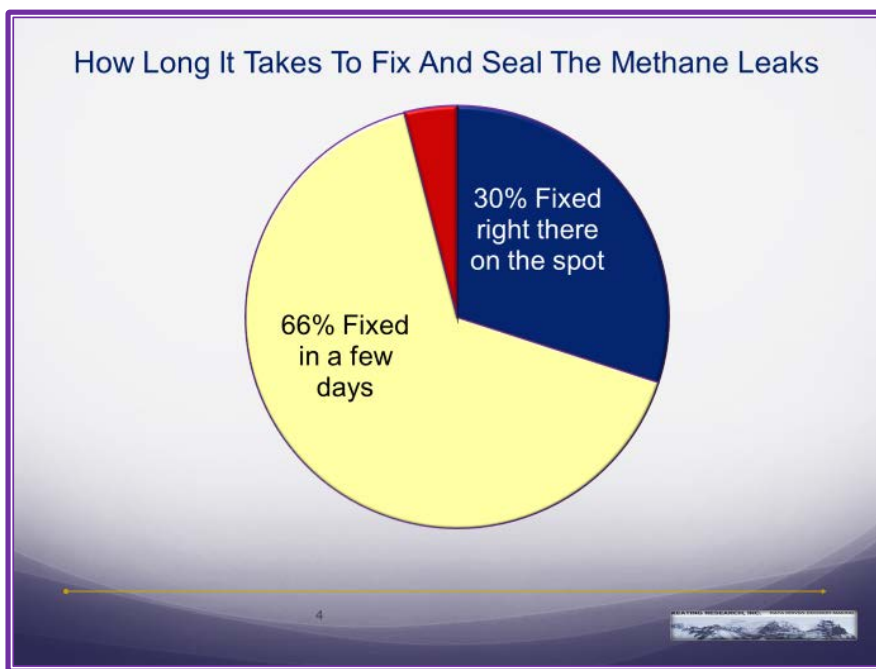
The cause of the leak is typically *debris*, a *loose connection* or *wear and tear* on the equipment. Specific examples given in the survey of equipment that was found to be leaking and the cause of the leak include the following:

T-12 thermostat regulator. The cause was dirt or debris in the component.

Packing on a valve. It was caused by a loose bolt.

High low controllers. The controller was faulty.

Loose fittings on separators. Most common is tanks.



Valve and flow line. It was caused by the age of the equipment.

Seal on a tank hatch. Debris caused the seal to leak

Hatch. The cause would be wear and tear.

Numeric devices. Loose packing.

The hatches on the storage tanks and the cause is over pressure of the storage tanks.

Well head the casing tubing is leaking because of its age.

Threading connections, high low controllers the thief patch seal, T-12 and liquid levels.

Flange, where to parts fit together and the seal of the flange will leak.

Pipe connection leak and the clamp was loose.

Leaks on a vapor line. Because of bad fittings.

Colorado's oil and gas companies are finding leaks across all types of equipment at the site, with the most leaks in the storage tanks, 8-of-10 representatives say that they are finding *a lot* or *some* leaks in the storage tanks.

Methane leaks are also typically found in systems other than gas wells and compressors, 6-of-10 representatives say that they are finding *a lot* or *some* leaks in the other systems or structures.

The methane leaks in the other systems or structures are primarily found in the *piping, threaded connections* or the *regulators*.

Representatives describe the following types of methane leaks they are finding on other systems or structures:

Pumps or valves or connectors.

Small connections like fittings, thermostat regulators, and pressure regulators.

Threaded connection.

Separators.

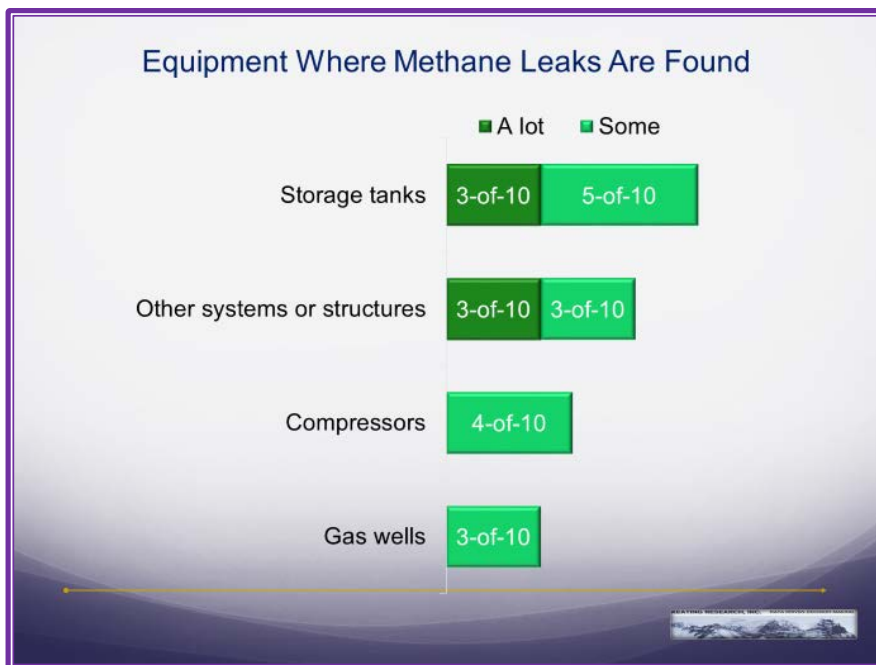
Piping and plumbing. Fitting valves and valve packing.

Pipe connections that have small leaks and they are fixed on the spot or at least a few days.

Emission control devices. Two and three phase separators and vapor recovery towers.

Storage facilities, piping, controllers.

Emission controls or vapor line piping.



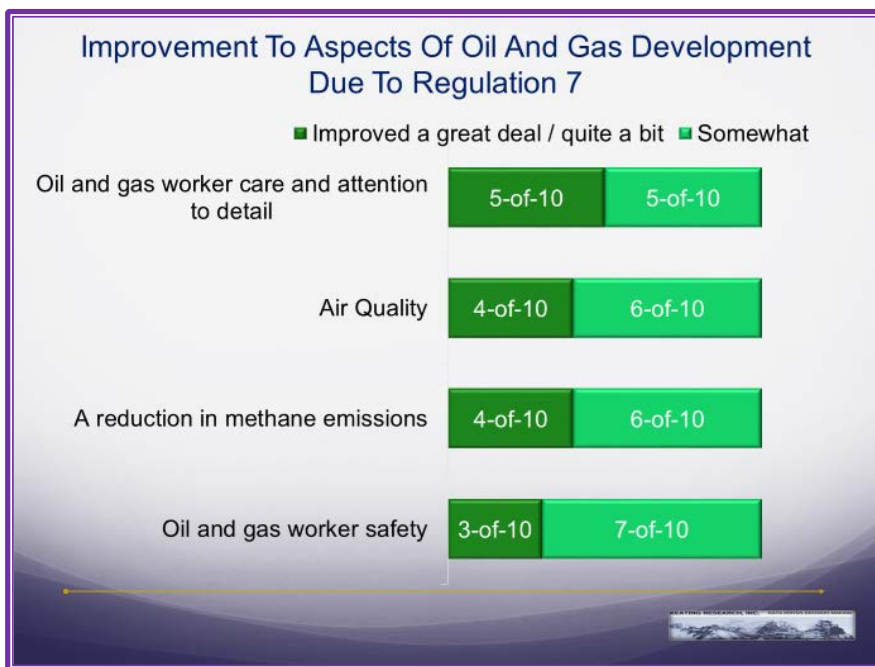
Oil and gas company representatives agree that Regulation 7 significantly reduces methane emissions in Colorado.

What is most encouraging is that oil and gas company representatives are taking notice that finding and fixing the thousands of methane leaks under Regulation 7 is reducing methane emissions in Colorado. Six-of-ten representatives *agree* with the statement – **Regulation 7 significantly reduces methane emissions in Colorado**, compared to 3-of-10 who *disagree*.

Four-of-ten representatives feel that Regulation 7 is improving air quality and reducing methane emissions *a great deal* or *quite a bit*, while the remaining say that these aspects are improving *somewhat*.

In addition to reducing emissions and improving air quality, oil and gas company representatives also believe that Colorado Regulation 7 improves their companies' efficiency – it improves oil and gas worker care, attention to detail, and safety.

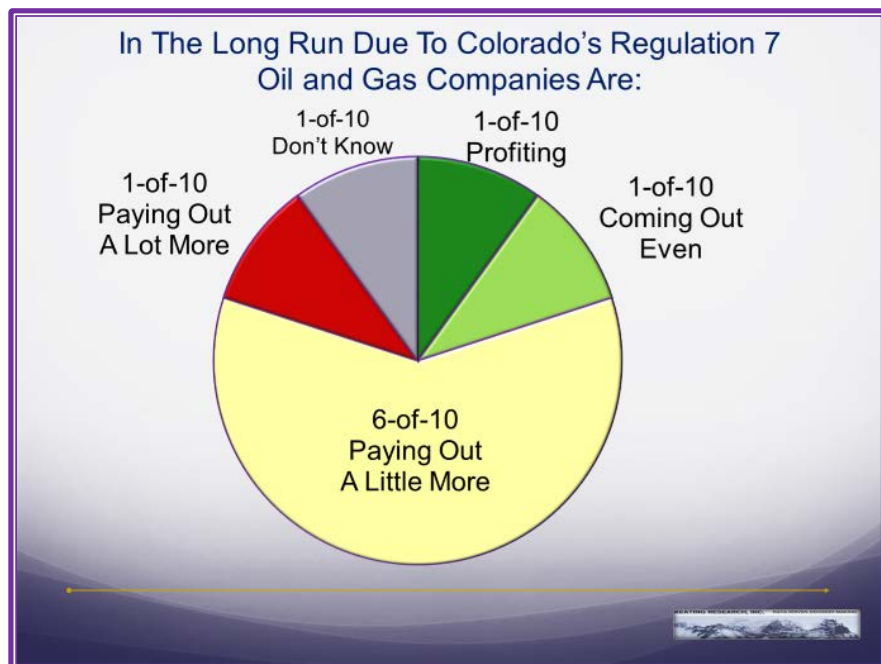
At the top of the list is oil and gas worker care and attention to detail, 5-of-10 representatives say worker care and attention to detail is improving *a great deal* or *quite a bit*, while the remaining say worker care and attention to detail is improving *somewhat*.



Eight-of-ten of oil and gas company representatives say that in the long run they are profiting, coming out even, or paying out just a little more than they are collecting in new revenue because of Colorado's Regulation 7.

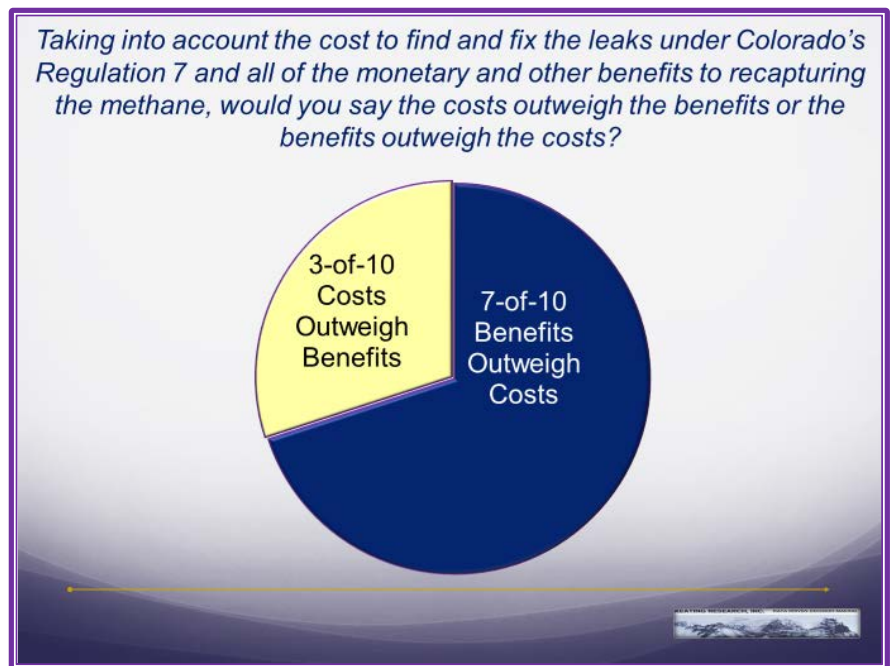
Oil and gas company representatives understand that when they balance out the money they are spending to find and fix the methane leaks against the additional revenues they are receiving from the gas they are recapturing, 8-of-10 say that they are profiting, coming out even or paying out *a little* more money than they are collecting in new revenue.

Only 1-in-10 say that they are paying out *a lot* more money to find a fix the leaks than they are collecting in new revenue.



Oil and gas company representatives believe the benefits to finding and fixing the leaks under Colorado's Regulation 7 outweigh the costs.

In fact, when all of the monetary and other benefits from Regulation 7 are taken into consideration, representatives are more than twice as likely to say that the benefits outweigh the costs. A full 7-of-10 believe all of the benefits of Regulation 7 outweigh all of its costs.



Chris Keating, Ph.D., President and founder of Keating Research, has worked as a public opinion pollster in Colorado for the past 21 years. Keating Research has established itself as the leading survey research firm in Colorado, having conducted hundreds of survey research projects in Colorado and Denver alone.

ADAMS BROADWELL JOSEPH & CARDOZO

A PROFESSIONAL CORPORATION

ATTORNEYS AT LAW

601 GATEWAY BOULEVARD, SUITE 1000
SOUTH SAN FRANCISCO, CA 94080-7037TEL: (650) 589-1660
FAX: (650) 589-5062

jmauldin@adamsbroadwell.com

SACRAMENTO OFFICE

520 CAPITOL MALL, SUITE 350
SACRAMENTO, CA 95814-4721TEL: (916) 444-6201
FAX: (916) 444-6209DANIEL L. CARDOZO
CHRISTINA M. CARO
THOMAS A. ENSLOW
TANYA A. GULESSERIAN
LAURA E. HORTON
MARC D. JOSEPH
RACHAEL E. KOSS
JAMIE L. MAULDIN
ELLEN L. WEHR

July 18, 2016

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95812-2828Re: The Coalition of California Utility Employees Comments on the
Proposed Regulation for Greenhouse Gas Emission Standards for
Crude Oil and Natural Gas Facilities

Dear Chair Nichols and Members of the Board,

The Coalition of California Utility Employees ("CUE") appreciates the opportunity to comment on the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities. CUE commends the Air Resources Board for developing such thorough and rigorous regulations that will prevent natural gas operators from permitting catastrophic releases like the occurrence at Aliso Canyon.

The proposed regulation will dramatically reduce methane emissions from the oil and natural gas sector. It covers greenhouse gas emissions, predominately methane, from production, gathering and boosting stations, and processing as well as natural gas storage and transmission compressor stations. It addresses both vented (intentional) and fugitive (unintentional) releases of greenhouse gases by processes at onshore and offshore crude oil or natural gas production facilities, crude oil, condensate and produced water separation and storage facilities, natural gas gathering and boosting stations, natural gas processing plants, natural gas transmission compressor stations, and natural gas underground storage.

The proposed regulation establishes emission standards for active and idle equipment and components at these facilities. Depending on the equipment or component, control mechanisms include vapor recovery, leak detection and repair (LDAR), and equipment replacement. Additionally, the proposed regulation

OP-6-1

July 18, 2016

Page 2

includes monitoring at underground natural gas storage facilities for the early detection of large leaks or well failures.

CUE supports the provisions of the proposed regulation. CUE has been an active party in developing best practices to reduce methane emissions on Investor Owned Utilities' natural gas lines and independent storage providers' wells in the California Public Utilities Commission proceeding resulting from Senate Bill 1371.¹ Many of the Air Resources Board's proposed regulations are aligned with the practices being developed in the CPUC proceeding. The provisions developed by both agencies will create a strong regulatory backbone for methane emission prevention in the oil and gas sector.

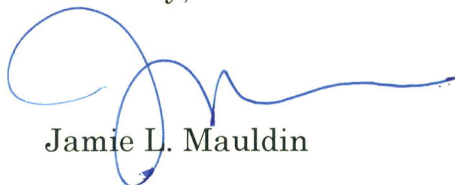
OP-6-1
cont.

However, CUE has serious concerns with the provisions rewarding oil and gas operators who find fewer leaks by allowing them to change from quarterly inspections to yearly inspections.² This loophole provides a perverse incentive for oil and gas operators to find and report fewer leaks. This will inevitably result in more undetected and unreported leaks, along with greater emissions. We strongly suggest that you should remove Section 95669(g)(1) and instead mandate quarterly inspections for all oil and gas operators—regardless of the amount of leaks they find.

OP-6-2

CUE supports the Air Resources Board's proposed regulation as it will prevent methane and GHG emissions from the oil and gas sector and provide accountability for oil and gas operators. However, the Air Resources Board must not inadvertently incentivize those operators to find fewer leaks just so they can reap the benefits of yearly versus quarterly inspections. The proposed regulation should be modified to remove that incentive and mandate quarterly inspections for all operators.

Sincerely,



Jamie L. Mauldin

JLM:ric

¹ Rulemaking 15-01-008.

² Section 95669(g)(1).

Central Valley Gas Storage, LLC

July 18, 2016

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Proposed Regulation Order: Subarticle 13 - Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

The Independent Storage Providers (Central Valley Gas Storage, LLC, Gill Ranch Storage, LLC, Lodi Gas Storage, L.L.C., and Wild Goose Storage, LLC; collectively, "ISPs") operate California Public Utilities Commission ("CPUC") certified underground natural gas storage facilities in California. The wells, pipelines, compressors, and appurtenant equipment at the ISP facilities were designed to modern gas storage facility standards and have been in service since the late 1990s at the earliest, and within the last five years for the most recent facilities. All of the injection and withdrawal wells at the ISP facilities were designed and constructed specifically for the intended purpose of gas storage and are not repurposed production wells.

The ISPs have carefully reviewed the California Air Resources Board's ("ARB") Proposed Regulation Order modifying Title 17, Division 3, Chapter 1, Subchapter 10, Article 4, Subarticle 13 and respectfully offer the following comments and recommendations regarding specific sections and subsections.

§ 95668 – Standards

(d) Reciprocating Natural Gas Compressors:

(4)

- (F) It appears that the section intended to be referenced in this section is 95668 (d)(4)(D) (instead of § 95688(d)(4)(D)).

OP-7-1

(i) Natural Gas Underground Storage Facility Well Monitoring Requirements:

(1)

- (B) Daily Screening: If Storage operators elect to utilize daily screening of each natural gas injection/withdrawal wellhead assembly, this section requires screening within a 200 foot radius. The ISPs respectfully point out that this distance is twice as far as the 100 foot radius specified in the leak detection protocols the ISPs submitted to the Division of Oil, Gas and Geothermal Resources ("DOGGR") in accordance with the Requirements for Underground Gas Storage Projects Emergency Regulations ("Emergency Regulations") that recently went into effect. Leaks that cannot be detected within a 100 foot radius are highly unlikely to be detected at 200 feet from the wellhead. In addition the Emergency Regulations allow for situations where an operator can "demonstrate that some part of that area is obstructed".¹ This section, as proposed, does not appear to take obstructions into consideration.

OP-7-2

ISP facilities are often located in rural agricultural areas and there are practical obstacles that limit the radial distance in which an on-foot inspection may take place. Such obstacles include:

¹ Chapter 4, Subchapter 1, Article 3, §1724.9 (e)

- An environmental buffer zone established in compliance with CPUC Environmental Conditions adjacent to the well pad area at one facility where extensive foot traffic would conflict with the intent to maintain a buffer zone for potential Giant Garter Snake habitat.
- Agricultural rice production whereby acreage within the specified radius may be flooded as part of the farming process and foot traffic is not possible.
- An irrigation canal within the specified radius where foot traffic cannot occur.

The ISPs recommend that the language in this section be modified to align with similar requirements in the Emergency Regulations to specify: 'Daily screening of each natural gas injection/withdrawal wellhead assembly, attached pipelines, and the surrounding area within a 100 200 foot radius of the wellhead assembly for leaks of natural gas, unless the operator can demonstrate that some part of that area is obstructed.'

The ISPs also note that expenditures they currently are making for continual daily screening are proving to be significant, and likely are well in excess of the environmental benefit derived from more immediate detection and repair of minor wellhead area leaks at ISP facilities. The ISPs would appreciate it if ARB would consider an approach for adjusting the frequency of such screening (perhaps to weekly), based on observed results when no leaks have been present. ARB similarly should review the cost-benefit impacts of the other requirements proposed in § 95668 (i).

- (C) Continuous Monitoring - wellheads: The ISPs note that the 200 foot radius specified in this section would typically extend beyond the property owned or controlled by the storage operator and, to the extent that equipment has to be installed beyond the operator's property to comply with this provision, the ISPs may not be able to comply. Accordingly, the ISPs also recommend changing the radius to 100 feet in this case. At present, ISPs are unlikely to utilize continuous monitoring of wellheads contemplated by this section (C) to meet the monitoring plan requirements of § 95668 (i)(1) because technology that can meet the requirements specified by this section is not currently commercially available at a cost-effective price, even when compared to the significant expense of daily screening activities. The ISPs have been testing various options available today. To date, none have been found that totally satisfy leak detection needs.

- (3) Monitoring plan: The ISPs are concerned that an implementation date of September 1, 2018 may not provide sufficient time to implement the measures prescribed by the monitoring plans to be approved in full or in part, or disapproved in full or in part, by ARB by March 1, 2018. Specifically, six months would not be enough time to incorporate "continuous monitoring of each natural gas injection/withdrawal wellhead assembly, attached pipelines, and the surrounding area" into the ISPs existing Supervisory Control And Data Acquisition (SCADA) systems. The ISPs recommend that the implementation date be specified as one year from the date that ARB communicates approval the plan to the operator.

- (6) ARB notification: There appears to be a typographical error in the first line of the first sentence of this paragraph ("is" should be "a"). This paragraph also contains a reference to a 200 foot radius and here also the ISPs recommend changing it to a 100 foot radius, for the reasons set forth above.

OP-7-2
cont.

OP-7-3

OP-7-4

OP-7-5

In addition, as ISP facilities are often located in rural agricultural areas that have naturally occurring methane sources (including rice fields), there is a strong possibility of "baseline" exceedances of 10% in instances where there is no gas leak whatsoever from storage facilities. Even an ambient methane concentration two or three times over a baseline background measurement may have nothing to do with the storage facility. This issue is magnified if an initial baseline is set at a very low level. The ISPs request that the approach contemplated by this section be modified as necessary to take this important fact into account. It is imperative that a proper baseline and exceedance level be established so that any reportable reading would clearly be due to natural gas emitted from the storage facility, and not from other methane sources. The ISPs are concerned that requiring frequent notifications to ARB, DOGGR and local air districts in non-leak situations would likely be confusing and burdensome to the agencies as well as the operators.

OP-7-5
cont.

§ 95669 – Leak Detection and Repair

- (e) Requirements under this provision appear to be duplicative of the daily or continual inspection specified in § 95668 (i)(1) (B) or (C). The ISPs recommend that language be added here clarifying that for natural gas underground storage facilities, the inspections conducted pursuant to § 95668 (i)(1) (B) or (C) satisfy this requirement as well.

OP-7-6

§ 95672 – Reporting Requirements

- (a)
- (8) For reasons stated above in the comments for § 95668 (i)(1)(B) and (C), the ISPs recommend changing the reference to a 200 foot radius to a 100 foot radius.
- (9) As discussed in the comment for § 95668 (i)(6), there is a strong possibility of baseline exceedances of 10% in instances where there are naturally occurring methane sources and there is no gas leak whatsoever from a storage facility. Accordingly, the ISPs recommend that the issue of naturally occurring methane sources, and the need to ensure a proper baseline and exceedance level to prevent activity in non-leak situations, be taken into consideration.

OP-7-7

The ISPs continue to operate their facilities in a safe and reliable manner and in compliance with applicable laws, rules and regulations. The ISPs appreciate the opportunity to comment on this Proposed Regulation Order and respectfully request that their comments be considered as development of the regulation progresses.

Sincerely,



John Boehme
Manager, Regulatory Affairs
Central Valley Gas Storage, LLC
3333 Warrenville Road
Lisle, Illinois 60532
630-245-7825

cc: Kathryn McCoy, Attorney for Central Valley Gas Storage, LLC
Ann Trowbridge, Day, Carter and Murphy, LLP; Attorneys for Gill Ranch Storage, LLC
Peter Esposito, Crested Butte Catalysts, LLC; Attorneys for Lodi Gas Storage, L.L.C.
Lawna Hurl, Senior Legal Counsel, Wild Goose Storage, LLC



Change. Not Charity

6420 Wilshire Blvd.
Suite 700
Los Angeles, CA 90048

323.556.7200
323.556.7240 (fax)

www.LibertyHill.org

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Via Electronic Submittal: http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=oilandgas2016&comm_period=A

Re: Comments urging strengthening of CARB's Proposed Regulation on Oil & Natural Gas Production, Processing, and Storage

The Liberty Hill Foundation wishes to offer brief comments on the proposed Oil and Natural Gas Production Processing, and Storage (the "Oil & Gas rule") regulation. We appreciate efforts of the California Air Resources Board (CARB) in developing the regulation, and urge the strengthening of measures to prevent practices leaving communities unprotected.

OP-8-1

Our foundation staff does not possess the technical expertise to make detailed and specific comments. However, we are acutely aware of the significant health impacts that specific communities in Los Angeles have suffered due to their proximity to active oil and gas drilling operations. For the last twenty years, Liberty Hill has been a significant funder of grassroots, environmental justice organizations in the Los Angeles region.

Liberty Hill issued a report in September 2015, "[DRILLING DOWN: The Community Consequences of Expanded Oil Development in Los Angeles](#)", documenting five examples of neighborhoods severely impacted by health ailments and disruption to their quality of life from noise, vibration and other air quality impacts. It is very clear that the pollutants and chemicals associated with oil and gas production are harmful to human health, in addition to the strong climate/GHG impacts of methane. Further, we are keenly aware that the industry has been insufficiently regulated and that much of the infrastructure—as demonstrated by the Aliso Canyon disaster—is in a state of significant disrepair. And, the close proximity of some of the facilities in densely populated urban areas like Los Angeles—some within just a few dozen feet of homes and schools—is of great cause for concern.

OP-8-2

We encourage the CARB to carefully review the detailed, technical letter submitted by Julia May, Senior Scientist with Communities for a Better Environment which calls for tighter leak standards consistent with best practice in oil refinery standards, accelerated implementation and strengthening of deadlines, exemption allowances, monitoring and enforcement requirements. We also encourage careful review of the letter submitted by Environmental Defense Fund which also calls for accelerated implementation, as well as the removal of the "step down" provision which relaxes the inspection schedule.

OP-8-3

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink that reads "Michele Prichard".

Michele Prichard
Director, Common Agenda



OG-OP-9-SC
(this letter has
two
attachments
including
>7000
signatures and
>200 "custom"
comments)

July 18, 2016

California Environmental Protection Agency
Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Notice of Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

The Sierra Club has collected public comments submitted by Sierra Club members and supporters on the Air Resources Board's draft safeguards against methane pollution from oil and gas facilities. The Sierra Club has collected those comments in trust and is submitting them now to be included in the public record.

Please find those comments in two attached files: One with the names and public comments of 196 members and supporters who submitted a personalized public comment, and one with the names of 7,281 members and supporters who signed on to endorse the message reproduced below:

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

OP-9-1

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

OP-9-2

OP-9-3

OP-9-4

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

OP-9-5

Thank you for your consideration.

I also ask that you disregard the public comments submitted in error by the Sierra Club earlier today, and accept these in their place.

Sincerely,

Lena Moffitt
Director, Sierra Club Beyond Dirty Fuels Campaign

First Name	Last Name	City	State	Zip Code
AniMae	Chi	Beverly Hills	CA	90210
ettie	councilman	Long Beach	CA	90808
ettie	councilman	Long Beach	CA	90808
sue	harrington	martinez	CA	94553
Michelle	Schumacher	San Clemente	CA	92673
Gaia	Memmo	Los Angeles	CA	90035
Kathleen	McDonald	Concord	CA	94521
Joan	Walker	Bishop	CA	93514
Whitney	Shibuya	Santa clarita	CA	91350
Margaret	Lirones	Corcoran	CA	93212
huguette	WILSON	NEWPORT BE	CA	92663
patricia	law	san diego	CA	92102
Annette	Raible	Petaluma	CA	94952
Violet	Enciso	Duarte	CA	91010
Cynthia	Wilder	Rancho Palos	CA	90275
Dennis	Landi	Long Beach	CA	90813
Gail	Alford	Santa Rosa	CA	95403
Judy	Yamahiro	Pacifica	CA	94044
Mary	Bobadilla	Antioch	CA	94509
Chantal	Condon	San Marcos	CA	92069
Ray	Saturno	El Cerrito	CA	94530
Gary	Thomsen	Newport Beac	CA	92661
Richard	Tietz	Lafayette	CA	94549
Laura	Strom	Los Angeles	CA	90034
Judy	Sharp	San Diego	CA	92120
Mary	Lopez	Citrus Height	CA	95610
Latifa	Hussaini	Anaheim	CA	92808
Barry	Jones	Los Angeles	CA	90027
Yin	So	Fremont	CA	94539
Mary	Mason	Huntington B	CA	92649
Margrit	Cheeseboro	Los Angeles	CA	90008
Julian	Chasin	Redondo Bea	CA	90277
Francis	Roberts	Eureka	CA	95501
Natalia	Pinto	Albany	CA	94706
Robert	Sculley	Davis	CA	95616
Linda	Kourtis	San Diego	CA	92117
Laurel	Scott	San Diego	CA	92108
Jim	Kuhlman	Costa Mesa	CA	92627
Barbara	Essenmacher	Modesto	CA	95351
Gary	Jones	San Marino	CA	91108
Tom	Walsh	Burbank	CA	91506
Diana	Aylward	Woodland Hill	CA	91367
Lynn	O'Hara	San Leandro	CA	94579
Amy	Franz	La Habra Hei	CA	90631
Heidi	Buech	Los Angeles	CA	90066
Louis	Soberanis	Sebastopol	CA	95472
Karl	Schumaker	Boulder Cree	CA	95006
Alvaro	Reis	Santa Clara	CA	95051
Steven	Hayashi	Los Gatos	CA	95032
O	Lewis	Los Angeles	CA	90009
Ty	Loomis	Laguna Beach	CA	92651
Peter	Wolf	Sebastopol	CA	95472
Eleanor	Dullea	Desert Hot Sp	CA	92241
Linda	Fleming	Milpitas	CA	95035
Kimberly	Thomas	San Diego	CA	92119
K	Weaver	Cottonwood	CA	96022
Janice	Pardoe	Berkeley	CA	94705
Samuel	Hergerather	Sebastopol	CA	95472

Karen	Berger	Montrose	CA	91020
Reyna	Garcia Ramos	Pomona	CA	91768
Lilibeth	Munoz	Alhambra	CA	91801
Shawn	Williamson	Studio City	CA	91604
Michael	Clayton	Culver City	CA	90230
Roz	Goldstein	Greenbrae	CA	94904
Arnaud	Dunoyer	Venice	CA	90291
Claudia	Munoz	Hawthorne	CA	90250
Rich	Masino	Del Mar	CA	92014
Kathy	Popoff	San Pedro	CA	90732
Morena	Loomis	Goleta	CA	93117
Sydney	Brown	Tracy	CA	95376
Robert	Crook	Sacramento	CA	95816
Avtar	Khalsa	Los Angeles	CA	90034
Otis	Benning	El Dorado Hill	CA	95762
Derek	Baker	Barstow	CA	92311
Paul	Welch	San Jose	CA	95118
Ms	Lilith	Ventura	CA	93003
Henrik	Fallian	Glendale	CA	91208
H.	Leff	San Francisco	CA	94108
Jeffery	Olson	Vista	CA	92084
Don	Green	Oakland	CA	94610
John	Wagner	Oxnard	CA	93030
Victoria	Wilks	Salinas	CA	93906
Sonja	Sokacich-Kae	Oakland	CA	94601
Mame	Boyd	Rancho Mirag	CA	92270
Jennifer	Arnold	Los Angeles	CA	90015
Cara Lou	Wicks	Oceanside	CA	92057
Carol	Eberling	Chico	CA	95926
Herb	Shoemaker	Carmel Valley	CA	93924
George	Ross	Woodbridge	CA	95258
Pamela R	Perls	Lafayette	CA	94549
Duncan	Van Arsdale	Burlingame	CA	94010
Rachael	Jett	Torrance	CA	90501
Carole	Gilllin	Simi Valley	CA	93065
Kathryn	Lanning	Visalia	CA	93277
Michael	Ford	Watsonville	CA	95076
Linda	Howie	Fresno	CA	93720
Patricia	Linder	San Jose	CA	95136
Noah	Armstrong	San Jose	CA	95123
Troy	Spieler	Riverside	CA	92516
Thomas	Maendle	Point Reyes S	CA	94956
Carolyn	Boor	Rancho Cucar	CA	91730
Kraig	Hamady	Carlsbad	CA	92011
Lisa	Larsen	Lancaster	CA	93539
Linnea	Fields	Elk Grove	CA	95757
John	Frazier	Encinitas	CA	92023
Byron	Fogel	Van Nuys	CA	91402
Greg	Ehlert	Ventura	CA	93003
Elizabeth	Davis	Davis	CA	95616
Jill	Rian	Oakland	CA	94602
William	Rowser	Napa	CA	94559
Pamela	Sandberg	Fort Bragg	CA	95437
Shawn	Bunn	Avila Beach	CA	93424
Gwen	Shaffer	Long Beach	CA	90803
Tulsi	Milliken	Fallbrook	CA	92028
Patricia	Takata	Thousand Oal	CA	91360
Sam	Romero	Stockton	CA	95206
Barbara	Sobilo	Monterey	CA	93940

Ray	Bartlett	Fountain Vall	CA	92708
Mira	Bolsakov	Mission Viejo	CA	92691
Ronald	Green	Santa Barbar	CA	93110
sam	romero	stockton	CA	95206
Cailin	Trimble	Hayward	CA	94544
Val	Cisneros	La Mirada	CA	90638
Marianna	Riser	Novato	CA	94949
Marc	Silverman	Los Angeles	CA	90068
Gerald	Czamanske	Palo Alto	CA	94303
Edward	Macan	Eureka	CA	95501
James	Fullerton	Scotts Valley	CA	95067
Regina	Phillips	Winnetka	CA	91306
Arlene	Encell	Los Angeles	CA	90064
Moriah	Woolworth	Cupertino	CA	95014
Ingrid	Skei	Thousand Oal	CA	91362
Sue	Alexander	San Ramon	CA	94583
Paula	Arthur	Westlake Vill	CA	91361
Adrian	Fried	Novato	CA	94947
James	Fullerton	Scotts Valley	CA	95067
Susan	Ellis	Calabasas	CA	91302
Jill	Woodmansee	Los Angeles	CA	90049
Kevin	O'Brien	Laguna Beach	CA	92651
Samuel	Popailo	West Hollywo	CA	90046
Lynne	Thomson	Orangevale	CA	95662
Marianna	Bodnar	Winchester	CA	92596
Cristina	Amarillas	Santa Rosa	CA	95404
Michael	D'Adamo	Kensington	CA	94707
Norm	Stanley	Yucaipa	CA	92399
Curtis	Gehman	Burlingame	CA	94010
Marianne	Tornatore	San Clemente	CA	92672
David	Vancelette	San Marcos	CA	92078
Robert And M	Keenan	Mission Viejo	CA	92691
Tracey	Quinn	Boulder Cree	CA	95006
Terra	Smiddy	Irvine	CA	92614
Debbie	Sturt	Marina	CA	93933
Luanne	Clayton	Sacramento	CA	95841
Hilda	Kurowski	Davis	CA	95616
Larry & Chery	Bartlett	Riverbank	CA	95367
Corey	Lappo	Tujunga	CA	91042
Kristey	Harrington	Desert Hot Sp	CA	92240
Lisa	Nakamura	Oakland	CA	94610
Curtis	Swan	Long Beach	CA	90802
Brad	Nelson	Oxnard	CA	93035
Karen	Lane	La Jolla	CA	92037
Gemma	Geluz	Fairfield	CA	94533
Julie	Gobert	Long Beach	CA	90805
Jeannette	Sumner	Avalon	CA	90704
John	Bates	Santa Clara	CA	95050
Rebecca	Overmyer-Ve	Whittier	CA	90601
Jennifer	Sellers	Concord	CA	94521
Jennifer	Sellers	Concord	CA	94521
Jennifer	Sellers	Concord	CA	94521
Laura	Willoughby	San Diego	CA	92107
Nikita	Metelica	Mountain Vie	CA	94043
Susan	Apgar	Tujunga	CA	91042
Peter	Worcester	San Diego	CA	92122
Jill	Blaisdell	La Canada Fli	CA	91011
Ivor	Baron	Studio City	CA	91604
Jerry	Hudgins	Point Reyes S	CA	94956

Michael	Stern	San Jose	CA	95123
Evan	Mc Dermitt	Fullerton	CA	92832
Alice	Alford	Blythe	CA	92226
Karina	Oleynikov	Van Nuys	CA	91406
Jon	Steenhoven	Santa Rosa	CA	95407
Dmichael	Cervenak	San Diego	CA	92131
Jennifer	Langfield	San Anselmo	CA	94960
Jennifer	Langfield	San Anselmo	CA	94960
Jennifer	Langfield	San Anselmo	CA	94960
Lawrence	Jimenez	Los Angeles	CA	90068
Liliana	Lettieri	Manhattan Be	CA	90266
Twik	Simms	Anaheim	CA	92801
Elvira	Arias	Harbor City	CA	90710
Marguerite	Etemad	San Francisc	CA	94115
Socrates	Calderon	Spring Valley	CA	91977
Andrew	Siegal	Concord	CA	94520
Andrew	Siegal	Concord	CA	94520
Andrew	Siegal	Concord	CA	94520
Andrew	Siegal	Concord	CA	94520
Andrew	Siegal	Concord	CA	94520
Mojgan	Mahdizadeh	Santa Clara	CA	95054
Doris	Rodriguez	Ontario	CA	91762
Michael	Brazil	Grass Valley	CA	95949
Lori	Wilson-Hopki	Auburn	CA	95603
Marcia	Haber	San Jose	CA	95125
Susan	Hilinski	Salinas	CA	93908
Ely	Ernest	San Francisc	CA	94115
Susan	Hilinski	Salinas	CA	93908
Rhonda	Oxley	San Francisc	CA	94122
Bina	Israni	South San Fr	CA	94080
Clotine	Minick	Little Rock	CA	93543
Nancy	Leon	Pacific Grove	CA	93950
Guy	Johnson	Orange	CA	92865
Janis	Christiansen	Menlo Park	CA	94025
Mary	Richardson	Napa	CA	94559
Christine	Weinstein	San Diego	CA	92111
Kirstie	Palmer	Redondo Bea	CA	90277
Sandy	Williams	Covina	CA	91723
Diena	Street	Modesto	CA	95355
Kimberlee	Tellez	Los Angeles	CA	90019
Lillian	Hom	Alameda	CA	94501
Morena	Dunn	Berkeley	CA	94702
stephanie	clark	Concord	CA	94520
Alexander	Gaya	Palo Alto	CA	94303
Debbie	Proctor	Ojai	CA	93023
Sharma	Gaponoff	Grass Valley	CA	95949
Tere	Lyndon	San Francisc	CA	94111
Francesca	Bolognini	Cambria	CA	93428
John	Miller	Newport Bea	CA	92660
Sydney	Ricks	Fresno	CA	93722
Michelle	Varni	Merced	CA	95340
Jeffrey	Dilallo	La Mesa	CA	91942
Stacy	Pasetta	Los Angeles	CA	90068
Joseph	King	Palm Springs	CA	92262
Bea	Shemberg	Playa Del Rey	CA	90293
Paul	Runion	Ben Lomond	CA	95005
Kendra	Young	San Jose	CA	95129
Juli	Walters	Petaluma	CA	94954
Colin	Lindsly	Walnut Creek	CA	94597

Bonnie	Stillwater	LOS ANGELES	CA	90020
John	Butkis	Beaumont	CA	92223
Janelle	Mccarthy	Newark	CA	94560
Geoffrey	Eargle	Sacramento	CA	95841
Dianne	Sullivan	Modesto	CA	95355
Pam	Reagor	Irvine	CA	92604
Pat	Obrien	Encinitas	CA	92024
Micki	Meredith	Cazadero	CA	95421
Joseph	Szabo	Los Angeles	CA	90045
Andy	Fisher	Portola Valley	CA	94028
Jerry	Torrance	Portola Valley	CA	94028
Barbara	Adams	Los Angeles	CA	90046
Anthony	James	North Hills	CA	91343
Joelle	Pluchon	Cloverdale	CA	95425
Rita	Poppenk	Union City	CA	94587
Victoria	Woerbermin	Los Osos	CA	93402
Chance	Rearden	West Hollywo	CA	90046
Magali	Sajan	Richmond	CA	94805
Tom	Pickens	Danville	CA	94526
Noreen	Ford	Belmont	CA	94002
Molly	Silva	Danville	CA	94526
Lorraine	Nauman	Nevada City	CA	95959
Anaundda	Elijah	San Luis Obis	CA	93401
Robert	Matlock	San Diego	CA	92104
Susan	Klebl	Santa Cruz	CA	95062
Heather	Kerr	San Jose	CA	95120
Marcia	Joswick	Pinole	CA	94564
Christian	Nelson	Oakland	CA	94606
Jim	Howe	Ceres	CA	95307
Howard	Holko	San Anselmo	CA	94960
Nancy	Neely	Pomona	CA	91767
Susan	Shields	Santa Barbar	CA	93105
Beverly	Wilets	San Jose	CA	95124
Bill	Munce	Palm Springs	CA	92264
Elizabeth	Ross	San Leandro	CA	94577
Yvonne	Quilenderino	Seaside	CA	93955
Julia	Thollaug	Montara	CA	94037
John	Cassidy	Brentwood	CA	94513
Sharon	Adamson	Roseville	CA	95747
Judith	Schumacher-	Walnut Creek	CA	94595
Judith	Smith	Three Rivers	CA	93271
Stephanie	Hood	Brownsville	CA	95919
Laura	Jensen	Modesto	CA	95354
Steve	Netti	Chula Vista	CA	91910
Patrick	Carr	Arcata	CA	95521
Chuck	Potter	Vallejo	CA	94590
John	Wooldridge	Rio Linda	CA	95673
Patrick	Burke	Ventura	CA	93004
Tom	Gaylo	Escondido	CA	92026
Kelleen	Gardner	Redding	CA	96002
Kelleen	Gardner	Redding	CA	96002
Yolanda	De La Torre	San Bruno	CA	94066
Linda	Brosh	Novato	CA	94947
Sonia	Cantu	San Francisc	CA	94133
Bill	Evans	La Mesa	CA	91942
Marjie	Echols	Paradise	CA	95969
Sharon	Steuer	San Francisc	CA	94110
Kate	Brotherton	Lake Forest	CA	92630
Dana	Gatto	Oakland	CA	94608

Joanne	Paris	San Francisc	CA	94103
Erica	Tyron	Claremont	CA	91711
Aryeh	Frankfurter	San Francisc	CA	94110
Cynthia	Mcgrane	Berkeley	CA	94702
Dennis	Rippenburg	Carmel By Th	CA	93921
Scott	Closson	Irvine	CA	92602
Kay	Ospital	Woodacre	CA	94973
Laura	Newton	Cathedral Cit	CA	92234
Deborah	Hanley	Studio City	CA	91602
Rand	Groh	Quincy	CA	95971
Constantina	Economou	Berkeley	CA	94704
Javier	Flores	San Diego	CA	92121
Waldemar	Kalinowski	Pacific Palisac	CA	90272
Corinna	Weber	Winters	CA	95694
Don	Banfield	Novato	CA	94945
Elmer	Anderson	Los Angeles	CA	90016
John	Dimercurio	Chico	CA	95973
Charles	Binckley	Richmond	CA	94801
Oya	Cavdar	San Jose	CA	95124
Lauren	Keenan	Salinas	CA	93908
Jane	Mcgraw	San Bernardin	CA	92404
Bill	Vartnaw	Petaluma	CA	94952
Brad	Mallory	Fresno	CA	93720
Len	Rogoff	Palm Desert	CA	92211
Bryna	Schreier	Burbank	CA	91504
Nancy	Clark	Reseda	CA	91335
Julien	Egger	Los Angeles	CA	90068
Neil	Cardew-Fanni	Dutch Flat	CA	95714
Kris	Muller	Berkeley	CA	94705
Tad	Goguen And F	Burbank	CA	91504
Anna	Campa	Hayward	CA	94541
Zakkary	Zoah	Eureka	CA	95503
Melissa	Heller-Booth	Highland	CA	92346
Glenyth	Turner	San Diego	CA	92117
Kathy	Underwood	Tehachapi	CA	93561
George	Grace	Los Angeles	CA	90027
Koll	Ellis	Kensington	CA	94707
Barry	Signorette	San Jose	CA	95129
Wendy	Wilke	Fresno	CA	93720
Jennifer	Cartwright	Rancho Santa	CA	92688
Sonia	Gonzalez	Los Angeles	CA	90031
Valerie	Sanfilippo	San Diego	CA	92111
Sheila	Martinez	Santa Maria	CA	93455
Annette	Raible	Petaluma	CA	94952
Jennifer	Rueda	Laguna Nigue	CA	92677
Linda	Clark	Folsom	CA	95630
Christian	Heinold	Oakland	CA	94612
Adam	Michno	Oakland	CA	94607
Carol	Lachata	Altadena	CA	91001
Chanel	Brown	Sacramento	CA	95821
Joan	Mac Beth	Berkeley	CA	94702
Ralph	Devoto	Kelseyville	CA	95451
Kathryn	Mahon	Pinon Hills	CA	92372
Grant	Rich	Oakland	CA	94609
Nick	Kerkhoff	Santa Cruz	CA	95060
Grace	Feldmann	Santa Barbar	CA	93105
Jeff	Levy	Oakland	CA	94602
Kristofer	Nurmia	Torrance	CA	90505
Deeann	Wong	San Diego	CA	92130

Teresa	Treiber	San Diego	CA	92106
Diane	Messick	Marina	CA	93933
Jamie	Rackley	Corralitos	CA	95076
Erin	Creel	Albany	CA	94706
Jeff	Thayer	San Diego	CA	92117
Arthur	Connor	Idyllwild	CA	92549
Nancy	Anderson	San Diego	CA	92128
David	Welts	San Diego	CA	92103
Charles	Idler	Santa Cruz	CA	95060
Phuong	Trinh	Davis	CA	95616
Sacha	De Nijs	Huntington B	CA	92647
Cindee	Grace	Eureka	CA	95501
Linda	Morgan	San Pablo	CA	94806
Deborah	Dearing	Santa Rosa	CA	95409
Susan	Gill	San Anselmo	CA	94960
Jo & Ogden	Hamilton	San Rafael	CA	94901
Don	Meehan	San Jose	CA	95124
Victoria	Silver	Irvine	CA	92617
Christa	Neuber	West Hollywo	CA	90069
Mary	Meehan	Los Angeles	CA	90035
Kurt	Bauereiss	Oakland	CA	94612
Michael	Kemmling	Alta Loma	CA	91701
Carol	Kirkwood	Huntington B	CA	92649
Jeanne	Shupala	Del Mar	CA	92014
Rebecca	Kocis	Victorville	CA	92392
Rachel	Young	Menlo Park	CA	94025
George	Bolanis	Pittsburg	CA	94565
Alisha	Nickols	Stockton	CA	95207
Lee	Reis	Berkeley	CA	94703
Brett	Thomsen	Redondo Bear	CA	90278
Nancy	Kirk	Clovis	CA	93619
Joy	Wood	Santa Cruz	CA	95060
Russell	Maxwell	Sacramento	CA	95811
Deanna	Knickerbocke	Santa Clara	CA	95050
Melinda	Goulart	Morgan Hill	CA	95037
Steven	Lamers	San Bernardi	CA	92404
Jack	O.	Laguna Beach	CA	92651
Denton	Murphy	Dublin	CA	94568
Abby	Bateman	San Diego	CA	92106
Maria	Schneider	San Diego	CA	92128
Catherine	Trejo	Mountain Vie	CA	94040
Lisa	Scott	Lafayette	CA	94549
Marisa	Tellez	West Hollywo	CA	90069
Thomas	Davis	Santa Cruz	CA	95062
Yvette	Dominguez	Hacienda Hei	CA	91745
Amanda	Olson	La Mesa	CA	91941
John	Flitcraft	Cambria	CA	93428
Thomas	Brustman	Walnut Creek	CA	94595
Vicki	Green, Ph.D.	Napa	CA	94558
Sam	Fagnoli	Los Angeles	CA	90064
Marie	Beckham	Aptos	CA	95003
Nina	Passariello	Chico	CA	95928
Lawrence	Maxwell	San Francisc	CA	94109
Valerie	Cooper	Compton	CA	90223
Zac	Pinard	Pleasanton	CA	94588
Joseph	Garza	Bakersfield	CA	93313
Meaghan	Simpson	Fortuna	CA	95540
Robin	Sloan	Novato	CA	94949
Julian	Yerena Jr	Parlier	CA	93648

Laura	Hough	Los Angeles	CA	90034
Aaron	Isherwood	Berkeley	CA	94710
Sara	Ross	Los Angeles	CA	90032
Robert	Hicks	Long Beach	CA	90803
Rose	Murphy	Watsonville	CA	95076
Jack	Robbins	Berkeley	CA	94705
Kimberly	Ohanian	San Diego	CA	92127
Gabriel	Chang	Bellflower	CA	90706
Lynn	Chiapella	Palo Alto	CA	94306
William	Briggs	Hermosa Bea	CA	90254
Bonnie	Breckenridge	San Diego	CA	92105
Hildy	Roy	Magalia	CA	95954
Caleb	Ellis	Los Angeles	CA	90046
Meghan	Wilkins	Ojai	CA	93024
Esther	Schiller	Newbury Park	CA	91320
Kathleen	Jacecko	Redondo Bea	CA	90278
Marie	Perry	Ceres	CA	95307
Pamela	Scott	Boulder Creek	CA	95006
RICHARD	MERK	Campbell	CA	95008
RICHARD	MERK	Campbell	CA	95008
Carmen	Ferraz	Sebastopol	CA	95472
Ingeborg	Mackay	Petaluma	CA	94954
Scarlet	Newman-Tho	Los Angeles	CA	90029
Lucile	Oliva	Tulare	CA	93274
Linda	Hite	Sacramento	CA	95833
Helen	Mehoudar	Berkeley	CA	94707
Caryn	Cowin	South Pasade	CA	91030
Laura	Holdenwhite	Huntington B	CA	92648
Michael	Hogan	Del Mar	CA	92014
David	Mckeever	Redwood City	CA	94062
Christina	Gregory	Riverside	CA	92507
Christine	Gladish	Sierra Madre	CA	91024
Wanda	Hendrix	Los Osos	CA	93402
Gregory	Taylor	Castro Valley	CA	94546
Steve	Ongerth	Richmond	CA	94801
Joe	LeBlanc	Sebastopol	CA	95472
Jacqueline	Walburn	Garden Grove	CA	92845
Valerie	Beard	Sacramento	CA	95820
Diana	Duncan	Santa Monica	CA	90403
Thomas	Campbell	Studio City	CA	91604
Judy	Wang	Campbell	CA	95008
Javier	Del Valle	Montebello	CA	90640
Jon	Bazinet	San Lorenzo	CA	94580
Joan	Savarese	Martinez	CA	94553
Gina	Gatto	Castro Valley	CA	94546
Polly	Lewis	Frazier Park	CA	93225
Joanna	Kung	Moraga	CA	94556
Charles	Weber	Oceanside	CA	92056
Victor	Mayper	Ben Lomond	CA	95005
Jan	Warren	Walnut Creek	CA	94598
Kristie	Wells	Los Osos	CA	93402
Glen	Himberg	Mill Valley	CA	94941
Sean	Corrigan	Bellflower	CA	90706
Richard	Schmidt	San Luis Obis	CA	93405
Margaret	Morales	Santa Cruz	CA	95062
Joanie	Murphy	San Jose	CA	95123
Kari	Walters	Pacific Palisac	CA	90272
Mynka	Draper	Los Angeles	CA	90042
Steven	Eagle	Stonyford	CA	95979

Linda	Cheatham	Carmel Valley CA	93924
Jennifer	Dokey	Palm Desert CA	92260
Blake	Mclean	Long Beach CA	90804
Patric	Steele	San Francisc CA	94122
Patricia	Appel	Laguna Beach CA	92651
Christi	Fisher	Corona CA	92879
Diane	Ryerson	Arcata CA	95521
Carol	Sanders	Santa Rosa CA	95404
Raymond	Capezzuto	Carlsbad CA	92009
Jean	Ricci	Belvedere Tib CA	94920
James	Silveira	Modesto CA	95356
Geneva	Omann	Weed CA	96094
June	Dean	Diamond Spri CA	95619
Judith	Alter	Los Angeles CA	90045
Joann	Mizutani	Sacramento CA	95816
Martin	Marcus	San Diego CA	92120
Forest	Frasieur	Benicia CA	94510
Nick	Gaetano	Laguna Beach CA	92651
Nancy	Mccoy	Napa CA	94559
Ruby	Tyus	La Mesa CA	91942
Beth	Bennion	McKinleyville CA	95519
Jeanette & De	Stokols	Irvine CA	92612
Deirdre	Casella	Los Angeles CA	90068
Mike	Swann	Anaheim CA	92806
Celeste	Anacker	Santa Barbar CA	93105
Millie	Madrid	Santa Ana CA	92704
Joyce	Sortland	Grass Valley CA	95945
Johnny	Blan	Daly City CA	94014
Daniel	Penisten	Sonora CA	95370
Billie	Swain	San Pablo CA	94806
Melinda	Lusk Zuerlein	Carlsbad CA	92008
Leonardo	Nunez	Lompoc CA	93436
Lanier	Hines	Redding CA	96002
Gomi	Bin	Westminster CA	92683
Emilio	Rocha	Downey CA	90242
Pam	Mettier	Cambria CA	93428
Marisa	Persaud	Panorama Cit CA	91402
Fredrick & Do	Boutin	Tuolumne CA	95379
Victoria	Buchwald	Oakland CA	94606
Henry	Kruger	Eureka CA	95501
Les	Roberts	Fresno CA	93704
Cara	Wahl	Bay Point CA	94565
Russell	Burke	Guerneville CA	95446
Cooper	Holland	San Diego CA	92107
Frances	Glenn	North Hollywo CA	91606
Vince	Brim	Alamo CA	94507
Kimo	Cochran	Guerneville CA	95446
William	Wollner	Stockton CA	95202
Mary	Haley	Elk Grove CA	95758
Philip	Hoehn	San Francisc CA	94114
Nancy	Rosa	Scotts Valley CA	95067
Diane	Haynes	Clovis CA	93612
Daniel	Holland	Arroyo Grand CA	93420
Lance	Parker	Santa Rosa CA	95403
Jonathan	Eden	Berkeley CA	94707
Suzanne	Harvey	Coarsegold CA	93614
Francis	Donnelly	Los Angeles CA	90078
Xoai	David	Bakersfield CA	93313
Jeff	Hoffman	Berkeley CA	94702

Cindy	Pu	Palo Alto	CA	94306
Lori	Conrad	Davis	CA	95618
Carrie	Stoeber	Carlsbad	CA	92009
Dustin	Marsh	Placerville	CA	95667
Ronald	Renirie	Walnut Creek	CA	94597
Tad	Frantz	Burbank	CA	91504
Mary Lou	Wilhelm	San Luis Obis	CA	93405
Richard	Reyes	Hercules	CA	94547
Kristen	Daniels	Tahoe City	CA	96145
Melinda	Gray	Los Angeles	CA	90035
Melvin	Taylor	Sacramento	CA	95823
Rita	Santos-Oyam	Long Beach	CA	90803
Pamela	Anderson	Campbell	CA	95008
Ruth	Selan	San Jose	CA	95128
Sarah	Jaeschke	Richmond	CA	94804
Valeria	Vincent Sanci	Berkeley	CA	94703
Frank	Selig	Hawthorne	CA	90250
Crystal	Hernandez	Torrance	CA	90501
Angela	Fox	Desert Hot Sp	CA	92240
James	Britton	94037	CA	94037
Patricia	Harp	Modesto	CA	95355
Cheryl	Albert	Freedom	CA	95019
Cheryl	Albert	Freedom	CA	95019
Margaret	Shuler	Monrovia	CA	91016
Cynthia	Wilder	Rancho Palos	CA	90275
Will	Finch	Los Angeles	CA	90066
Kathleen	Young	Oakland	CA	94619
Susan	Cliff	Mount Shasta	CA	96067
Eric	Swan	Sebastopol	CA	95472
Carol	Wiley	Victorville	CA	92394
Lynn	Alley	Carlsbad	CA	92011
Sue	Blockstein	San Mateo	CA	94402
Carol	Gordon	Los Angeles	CA	90027
Adam	Wiscomb	San Francisc	CA	94104
Marisa	Rich	Oakland	CA	94603
Verna	Harrison	Chatsworth	CA	91311
Jim	Ewing	Bakersfield	CA	93312
Amy	Barron	Selma	CA	93662
Sheldon & Sh	Pitesky	Los Angeles	CA	90049
Vu	Nguyen	Oakland	CA	94602
Anne	Mc Bride	Auburn	CA	95602
Gabriel	Steinfeld	Oakland	CA	94610
Rita	Webber	Valley Village	CA	91607
Willette	Lowe	San Diego	CA	92128
Stacey	Rohrbaugh	Willits	CA	95490
David	Askew	San Francisc	CA	94108
Mary	Franz	Laguna Beach	CA	92651
Carol	Wiley	Victorville	CA	92394
Mary	Small	Santa Clara	CA	95051
Melanie	Goldman	Valley Center	CA	92082
Ben	Martin	Mountain Vie	CA	94040
Gail	Wilke	Sunland	CA	91040
Annamarie	Jones	Alturas	CA	96101
Nancy	Burdge	San Diego	CA	92124
Nancy	Burdge	San Diego	CA	92124
Stacy	Thompson	Alta Loma	CA	91701
June	Cancell	Palo Alto	CA	94306
Heather	Sargeant	Twin Peaks	CA	92391
Rene	Maurice	San Francisc	CA	94117

Jeff	Ellis	Santa Ana	CA	92705
Mark	Foy	Berkeley	CA	94705
Melody	Ross	Santee	CA	92071
Alicia	Jackson	Vallejo	CA	94591
R.	KEATING	West Hills	CA	91308
Elaine	Barrett	San Diego	CA	92103
Kali	Zulu	Santa Maria	CA	93457
Russell	Grindle	Fairfield	CA	94533
Sylvia	De Baca	San Dimas	CA	91773
Madeleine	Fisher-Kern	Los Angeles	CA	90036
Diana	Bohn	Berkeley	CA	94707
Ernie	Walters	Union City	CA	94587
Nora	Doyle	Studio City	CA	91604
William	Schoene	Santa Monica	CA	90405
Louise	Mann	San Francisc	CA	94109
Linda	Bruce	Yuba City	CA	95993
Eric	Trinque	Ventura	CA	93001
Marianne	Brettell-vaugh	Bishop	CA	93514
Keisha	Evans	East Palo Alto	CA	94303
Jessica	Likens	Buena Park	CA	90620
Lenore	Dowling	Los Angeles	CA	90039
Ginger	Schedler	Fresno	CA	93728
Jo	Zhou	Irvine	CA	92614
Dede	Goddard	Sonoma	CA	95476
Mike	Kehl	San Francisc	CA	94133
Laura	Milbury	Modesto	CA	95355
Elisse	De Sio	San Carlos	CA	94070
Lynn	Quirolo	Albany	CA	94706
Efren	Cruz	San Francisc	CA	94105
Larry	Sheehy	Ukiah	CA	95482
Art	Koertz	Riverside	CA	92514
Steve	Colton	Glendale	CA	91206
Brian	Becker	San Diego	CA	92102
James	Mccord	Carlsbad	CA	92011
Gabriel	Madrigal	Willits	CA	95490
Richard	Thoele	San Fernando	CA	91340
Clark	Cole	Alameda	CA	94501
Emily	Lindsey	Berkeley	CA	94702
Vikki	Johnson	Sacramento	CA	95821
Tim	Gundlach	San Carlos	CA	94070
Adrienne	Kercsak	La Mesa	CA	91941
Kate	Lunn	Arroyo Grand	CA	93420
Robert	Keats	Santa Barbara	CA	93109
Carol	Hiestand	Joshua Tree	CA	92252
Nelson	Molina	Buena Park	CA	90620
Abraham	Oboruemuh	Riverside	CA	92505
David	Soto	Santa Clarita	CA	91390
Daniele	Martarelli	Los Angeles	CA	90026
John	Borst	Paso Robles	CA	93446
Genesis	Silva	Modesto	CA	95354
Charles	Richard	Antioch	CA	94509
Mary	Mcinerny	Green Valley	CA	92341
Steve	Lesjak	Cool	CA	95614
Steve	Lesjak	Cool	CA	95614
Shawna	Hedley	San Francisc	CA	94109
Janis	Andersen	San Diego	CA	92110
Elizabeth	Herbert	Santa Cruz	CA	95060
Lorraine	Masten	Bishop	CA	93514
Thomas	Habermann	San Jose	CA	95124

Miriam	Krausz	Studio City	CA	91604
Douglas	Benedict	Santa Monica	CA	90405
Roberta	Millstein	Davis	CA	95616
Andrew	Rodriguez	Fresno	CA	93711
Bob	Simmons	West Covina	CA	91791
Kajsa	Ingelsson	West Hollywo	CA	90046
Peter	Newman	Fremont	CA	94538
Melissa	Gutierrez	San Diego	CA	92109
Maria	Veghte	San Diego	CA	92166
Maria	Veghte	San Diego	CA	92166
Richard	Mckee	Santa Rosa	CA	95404
Joshua	Bartholomew	Sacramento	CA	95820
Edith	Clemons	Adelanto	CA	92301
Jerry	Nailon	Sacramento	CA	95831
Tara	Brown	San Bernardi	CA	92407
Marge And M	Adams	San Jose	CA	95118
Catherine	Moffat	Buttonwillow	CA	93206
Catherine	Moffat	Buttonwillow	CA	93206
Gilda	Fusilier	Sacramento	CA	95831
Richard	Blain	Temecula	CA	92592
Tanya	Phillips	Carlsbad	CA	92009
Helen	Mcallister	Hidden Valley	CA	95467
Helen	Mcallister	Hidden Valley	CA	95467
Nanlouise	Wolfe	Santa Cruz	CA	95060
Sandra	Running	Whittier	CA	90604
Ravin	Carlson	San Clemente	CA	92672
Chris	Conell-Price	Palo Alto	CA	94303
Amy	Oxender	Sonora	CA	95370
Suzanne	Kunstman	Canyon Coun	CA	91387
Robert	Goings	Springville	CA	93265
Brendan	Smith	Santa Rosa	CA	95403
J	Perryman	Daly City	CA	94015
John	Knox	Chula Vista	CA	91914
Michael	Rha	Santa Monica	CA	90404
David	Raye	Salinas	CA	93908
Irene	Lutz	Canyon Cntry	CA	91351
William	Warren	Anaheim	CA	92801
Milton	Kreml	Vista	CA	92084
Ian	Murray	Santa Rosa	CA	95405
Gary	Hartung	Simi Valley	CA	93063
Li-Hsia	Wang	Berkeley	CA	94705
Oscar	Alvarez	Tujunga	CA	91042
Patricia	Bradford	Bolinas	CA	94924
Eric	Melendez	Los Angeles	CA	90006
Megan	Hockwalt	Rancho Cucar	CA	91739
Warren	Fries	Carlsbad	CA	92009
Lori	Crockett	Mount Shasta	CA	96067
Judy	Goldman	San Diego	CA	92127
Elizabeth	Estes	Pasadena	CA	91107
Barbara	Railsback	Santa Rosa	CA	95403
Alan	Schenck	Sunnyvale	CA	94087
Lisa	Kutner	San Diego	CA	92103
Suzanne	Parkhurst	Auburn	CA	95602
Tiffany	Kramer	San Diego	CA	92154
Cyd	Rochford	Grass Valley	CA	95949
James & Caro	Patton	Kensington	CA	94708
Fatima	Quintero	North Hollywo	CA	91601
Darius	Fattahipour	San Diego	CA	92127
Rene	Alvarez	Tecate	CA	91980

S	Hansen	San Anselmo	CA	94960
Judith	Luchsinger	Lakeport	CA	95453
Victor	Kirmes	Cameron Park	CA	95682
Diana	Thomas	Petaluma	CA	94954
Frank	De Haan	Sun Valley	CA	91352
Sue	Massey-Kirkp	Scotts Valley	CA	95066
Henriette	Groot	Los Osos	CA	93402
Anne	Swanson	Campbell	CA	95008
David	Swanson	Campbell	CA	95008
Elizabeth	Sather	Fillmore	CA	93015
Reva	Biers	Tarzana	CA	91356
Reva	Biers	Tarzana	CA	91356
Catherine	Glahn	San Mateo	CA	94402
Joel	Johnson	Santa Cruz	CA	95060
Natalie	Kovacs	Irvine	CA	92620
Nancy	Friedman	Oakland	CA	94610
Patricia	Wilburn	Santa Rosa	CA	95407
Joleen	Siebert	Reedley	CA	93654
Sarah	Lifton	Encinitas	CA	92024
Beverley	Odell	Sebastopol	CA	95472
Aimee	Wyatt	Lomita	CA	90717
Ken	Yoskowitz	Paradise	CA	95969
Maureen	Cole	Redwood City	CA	94062
William	Posey	San Diego	CA	92107
Summer	Spinks-Maras	Costa Mesa	CA	92626
Shelley	Brown	Los Angeles	CA	90016
Deb	Gisvold	Fontana	CA	92337
Robin	Newquist	Pasadena	CA	91105
Lauren	Ranz	Lafayette	CA	94549
Debra	Lane	Fort Bragg	CA	95437
Y	Saavedra	Redwood City	CA	94064
Marion	Klein	Los Angeles	CA	90064
Marion	Klein	Los Angeles	CA	90064
Marion	Klein	Los Angeles	CA	90064
Frank	Mullin	Santa Monica	CA	90405
Frank	Mullin	Santa Monica	CA	90405
Candy	Bowman	Placerville	CA	95667
Barrie	Stebbins	Stinson Beach	CA	94970
Richard	Boothe	San Luis Obis	CA	93401
Nancy	Young	Laguna Wood	CA	92637
Dana	Stewart	San Diego	CA	92108
Sue	Barthelow	Auburn	CA	95602
David	Hochstetler	Menlo Park	CA	94025
Matthew	Zola	Long Beach	CA	90803
Zachary	Delaney	Nevada City	CA	95959
Jack	Exton	Roseville	CA	95678
Benjamin	Etgen	Sacramento	CA	95821
Pamela	San Miguel	Santa Cruz	CA	95061
Joyce	Fung	San Leandro	CA	94577
Matthew	Owen	Pasadena	CA	91107
amy	faust	Oakland	CA	94618
Bayard	Fox	Napa	CA	94558
Nancy	Havassy	Oakland	CA	94611
g	Weininger	Alameda	CA	94501
Jude	Fletcher	Oakland	CA	94607
John	Livingston	Redding	CA	96001
Natasha	Dyer	Long Beach	CA	90802
Laurel	Maurer	Penngrove	CA	94951
Sharon	Steuer	San Francisc	CA	94110

Ed	Sweet	Truckee	CA	96161
Ana	Karen Macedo	Beverly Hills	CA	90210
John	Nadolski	Antelope	CA	95843
Betty	Eiseman	Westlake Village	CA	91361
Erica	Ford	Anaheim	CA	92806
Lisa	Engstrom	Tustin	CA	92780
Lucas	Lenhert	azusa	CA	91702
Barbara	Pampalone	Chatsworth	CA	91311
Barbara	Pampalone	Chatsworth	CA	91311
Amy	Sullivan	San Francisco	CA	94114
Anita	Coolidge	Cardiff	CA	92007
Shirley	Crisci	Ontario	CA	91764
Cheyenne	Fincham	Lake Elsinore	CA	92530
Hugh	Sutherland	Goleta	CA	93117
Mac	Bakewell	Santa Barbara	CA	93109
Brooke	Carlson	San Francisco	CA	94102
Debra	Salcido	Ontario	CA	91764
L	Parrish	Carmel	CA	93923
Deborah	Childers	Modesto	CA	95350
Michael	Levinson	daly city	CA	94015
Josho	Somine	Sebastopol	CA	95472
Bethan	Carter	Santa Cruz	CA	95062
Sandra	Harper	Simi Valley	CA	93063
Michele	Young	Bishop	CA	93514
Mark	Reback	Los Angeles	CA	90042
Alden	Jenks	Oakland	CA	94609
Blair	Francis	San Diego	CA	92106
Davide	Bergamasco	Sunnyvale	CA	94086
Rosalind	Milliken	Indio	CA	92203
Daniel	Stephenson	Shingle Spring	CA	95682
Laurie	Myres	La Crescenta	CA	91214
Erika	Vadopalas	Moss Beach	CA	94038
Todd	O'Connor	South Lake Tahoe	CA	96150
Lindsay	Crouse	Sherman Oaks	CA	91403
Sharon	Rumley	Arroyo Grande	CA	93420
M.	Steere	Forestville	CA	95436
David	King	Los Angeles	CA	90014
Patricia	Savage	Mammoth Lakes	CA	93546
Josan	Feathers	La Mesa	CA	91941
Lisa	Todd	Santa Cruz	CA	95060
Korin	Becraft	Oakland	CA	94611
John	Rowell	Los Gatos	CA	95032
Selieta	Williamson	Sebastopol	CA	95472
Gonzalo	Azcona	San Anselmo	CA	94960
Jeff	Tavangar	Santa Cruz	CA	95062
Sonya	Wood	Rocklin	CA	95677
Edwina	Smith	San Francisco	CA	94114
Robert	Petersen	Pacific Grove	CA	93950
Maxine	Lewis	Oakland	CA	94609
William	Weaver	Lincoln	CA	95648
Marsha	Hoff	Stockton	CA	95204
Laura	Herndon	Burbank	CA	91505
Pascale	Macleod	San Francisco	CA	94121
Rebecca	August	Buellton	CA	93427
Joan	Forest	Santa Rosa	CA	95409
Pamela	Peck	Watsonville	CA	95076
Maeryn	Boirionnach	Woodland	CA	95695
Karen	Bailey	Santa Monica	CA	90403
Joshua	Dehtan	Winchester	CA	92596

Mary	Pagliero	Martinez	CA	94553
Katie	Thomas	Sacramento	CA	95818
Jacqui	Bradshaw	Tehachapi	CA	93581
Victor	Maletic	Antioch	CA	94509
Nicole	Marter	Newhall	CA	91381
Dave	Alexander	Bellflower	CA	90706
M. K.	Russell	Mill Valley	CA	94941
Robert	Tozier	Poway	CA	92064
Brandon	Collins	Encinitas	CA	92024
Lydia M.	Villalobos	Sylmar	CA	91342
Melvin	Herlin	Laguna Nigue	CA	92677
Gabriella	Madriles	Los Angeles	CA	90003
Andy	Hou	Chino Hills	CA	91709
Alex	Flores	Oceanside	CA	92056
Barbara	Bersell	Barbara	CA	90064
Janelle	Honles	Camarillo	CA	93012
Roxanne	Mendoza	Livermore	CA	94551
Robin	Weirich	Irvine	CA	92618
David	Cotner	Ventura	CA	93001
Molly	Pilson	Gilroy	CA	95020
Flynn	Coleman	Los Angeles	CA	90025
Robert	Petermann	Escondido	CA	92026
Ed	Atkins	Boulder Creek	CA	95006
Hannah	Lewis	Berkeley	CA	94720
Theodore & R	Snyder	Granada Hills	CA	91344
Chris	Dunnbier	Healdsburg	CA	95448
J W	White	Los Angeles	CA	90045
Julia	Broad	Anaheim	CA	92804
Genevieve	Hahn Kerr	San Anselmo	CA	94960
Connie	Yee	South Pasade	CA	91030
Louise	Rangel	Santa Paula	CA	93060
Denise	Cugini	Petaluma	CA	94953
Katherine	Vickery	Santa Rosa	CA	95404
Eileen	Hinds	Concord	CA	94521
Ken	Chizinsky	Santa Cruz	CA	95060
Kathy	O'Gorman	Pasadena	CA	91105
Cari	Moore	Fullerton	CA	92832
Laura	Manning	Goleta	CA	93117
Jean & Andy	Danver	Los Altos Hills	CA	94022
Samuel	Wong	West Covina	CA	91792
Noah	Hall	Long Beach	CA	90805
Chris	Mills	Needles	CA	92363
Shelly	Morgan	San Clemente	CA	92672
Jerry	Levesque	Rancho Palos	CA	90275
Trymon	Hunter	Sonoma	CA	95476
Abigail	Usita	San Jose	CA	95148
Tamara	Mccready	Simi Valley	CA	93063
Ellyn	Kearney	Pasadena	CA	91103
Cherie	Dubois	Napa	CA	94558
Fernando	Castrillon	Albany	CA	94706
Scott	Jung	South Pasade	CA	91030
Kathy	Haber	Santa Cruz	CA	95060
Monte	Gullo	Sacramento	CA	95815
Tamara	Hulsey	El Cajon	CA	92020
Keith	Rhinehart	Santa Clara	CA	95050
Claire	Russell	Mill Valley	CA	94941
Lisa	Gee	Lisa	CA	91224
Kenway	Hoey	San Diego	CA	92122
Linda	Medeiros	Cloverdale	CA	95425

Paul	Kemp	Monrovia	CA	91016
Beverly	Freudiger	Benicia	CA	94510
William	Modesitt	San Diego	CA	92117
Valerie	Ralston	Mi Wuk Villag	CA	95346
Dianne	Winne	Oakland	CA	94602
Justin	Chernow	Paso Robles	CA	93446
Arthur	Molho	Placerville	CA	95667
Kevin	Mcdonald	Campbell	CA	95008
Michelle	Schamach	Petaluma	CA	94952
Sara	Williams	Sherman Oak	CA	91423
Victoria	Flamenco	Mountain Vie	CA	94043
s	jones	huntington be	CA	92626
carol	Ellenberger	Morgan Hill	CA	95037
Faith	Strailey	Quincy	CA	95971
Arlis	Reynolds	Costa Mesa	CA	92627
Gabrielle	Ebert	Los Angeles	CA	90039
Bronte	Kass	Los Gatos	CA	95030
Stanley	Hutchings	Palo Alto	CA	94301
Dennis	Eicholtz	Chico	CA	95926
Cole	Mountain	Mendocino	CA	95460
Lauren	Matelski	Woodland	CA	95695
Eugenia	Larson	San Ramon	CA	94582
Louise	Monahan	Louise	CA	95425
Claire	Watson	Pleasant Hill	CA	94523
Ernet	Garayan	Glendale	CA	91206
Zach	Morris	Chico	CA	95928
Anne	Dewberry	Topanga	CA	90290
Valerie	Zborowski	Campbell	CA	95008
Chris	Ashton	San Diego	CA	92119
Steve	Hanlon	Los Angeles	CA	90049
James	Voight	San Diego	CA	92109
Samuel	Durkin	Fairfield	CA	94534
Alan	Gonzalez	Long Beach	CA	90815
Peter	Lee	Pomona	CA	91766
Joyce	Pennell	San Mateo	CA	94402
Tom	Gallagher	Burlingame	CA	94010
M	Shuster	Sierra Madre	CA	91024
John	Oda	San Francisc	CA	94115
Lydia	Henry	Glendale	CA	91202
Jan	Herbert	Santa Rosa	CA	95403
Sarah	Murdoch	Pacific Palisac	CA	90272
Joan	Mortenson	Huntington B	CA	92648
Matthew	Reola	San Clemente	CA	92672
Karen	Maki	Menlo Park	CA	94025
Winke	Self	La Jolla	CA	92037
Veronica	Pedroza	Los Angeles	CA	90015
John	Coakley	Sherman Oak	CA	91423
Ed	Martin	Hawthorne	CA	90250
Rose	He	Duarte	CA	91010
Diana	Day	Monterey	CA	93942
David	Okner	Lafayette	CA	94549
Eleanor	Cohen	Oakland	CA	94602
Willa	Oconnor	Kensington	CA	94708
Jane	Robinson	Santa Rosa	CA	95404
Shalimar	Wijay	Garden Grove	CA	92844
Genevieve	Monks	Fairfield	CA	94534
Amelia	Gonzalez	Piru	CA	93040
Ann	Rice	Fremont	CA	94536
Arthur	Delgadillo	Lakewood	CA	90715

Aimee	Darrow	Venice	CA	90291
Lisa	Krausz	Tiburon	CA	94920
Timothy	Harden	Redwood City	CA	94063
J.A.	Blum	San Francisc	CA	94110
Andy	Tomsky	San Diego	CA	92102
Virginia	Watson	Los Angeles	CA	90026
Stacey	Sklute	Los Angeles	CA	90034
Maria	Brown	Mill Valley	CA	94941
James	Connolly	Chico	CA	95926
Richard	Karlinksi	Imperial Beac	CA	91932
Kara	Littell-Mcwilli	Byron	CA	94514
Robert	Nola	Los Angeles	CA	90066
Richard	Boles	San Marino	CA	91108
David	Harralson	Hollywood	CA	90068
Cristina	Juran	Perris	CA	92571
Lotti	Knowles	Valley Glen	CA	91401
Leni	Mortenson	Fresno	CA	93727
Helena	Wilcox	Stockton	CA	95204
David	Shannahoff-K	Del Mar	CA	92014
Moktar	Salama	Fountain Vall	CA	92708
Pauline	Haggerty	Daly City	CA	94014
fred	Keenan	Simi Valley	CA	93065
Jane	Ellis	Berkeley	CA	94710
Kathie	Piccagli	San Francisc	CA	94112
Mari	Matsumoto	Alameda	CA	94501
Molly	Huddleston	Santa Rosa	CA	95402
Julie	Wartell	San Diego	CA	92109
Arthur	Gregorian	Oakland	CA	94602
Ricardo	Mendez	Los Angeles	CA	90036
Estella	Edwards	Walnut Creek	CA	94598
Amanda	Zangara	Sebastopol	CA	95472
Mary Lou	Copp	Mountain View	CA	94043
Madeline	Stacy	Oakland	CA	94612
Ronald	Weber	San Ysidro	CA	92173
Richard	Peters	Sonoma	CA	95476
Marie	Mika	San Francisc	CA	94121
Mariam	Shah-Rais	Los Angeles	CA	90035
Lesley	Beatty	Burlingame	CA	94010
Tupefaavae	Auelua	Victorville	CA	92392
Karen	Norton	Rocklin	CA	95677
Bea	Cohen	Desert Hot Sp	CA	92241
Dean	Vogel	Davis	CA	95616
Sandra	Jaffe	Los Angeles	CA	90036
Karen	Hildebrand	Santa Cruz	CA	95060
Jill	Koenigsdorf	Sonoma	CA	95476
Catherine	Uchiyama	Salinas	CA	93906
Stephanie	Norgard	Clovis	CA	93619
Helen	Dickey	El Cerrito	CA	94530
Mara	Zakrajsek	Lompoc	CA	93436
Catherine	Dean	Murrieta	CA	92562
Mary	Mcauliffe	Los Angeles	CA	90028
Laurie	Barlow	San Marino	CA	91108
Alexis	Morris	San Francisc	CA	94122
John	Soltero	Sherman Oak	CA	91423
Susan	Lynch	Pacific Palisac	CA	90272
Patrick	Russell	Oakland	CA	94618
Cheryl	Weiden	Los Altos	CA	94022
Moe	Stavnezer	San Gabriel	CA	91775
Erin	Stone	Eureka	CA	95501

Ronald	Cheng	San Jose	CA	95112
Paula	Newton	Santa Rosa	CA	95404
Debra	Polansky	Auburn	CA	95603
Joann	Offill	Ventura	CA	93004
Marilyn	Spivey	San Pedro	CA	90731
Stephen	Sharnoff	Berkeley	CA	94708
Raymond	Marshall	Foresthill	CA	95631
Ken	Sanford	Escondido	CA	92029
Richard	Jacobel	Oakhurst	CA	93644
Victor	De Vlaming	Sacramento	CA	95821
Mar	Marc	Santa Cruz	CA	95062
Vicki & Rod	Kastlie	San Diego	CA	92107
Walter	Bodger	Whittier	CA	90601
Claire	Broome	Berkeley	CA	94708
Arleen	Whitmore	San Leandro	CA	94577
Drew	Feldmann	San Bernardino	CA	92405
Dave	Ogilvie	Santa Barbara	CA	93105
Lynn	Hansen	Thousand Oaks	CA	91360
Carolina	Hasenau	Los Angeles	CA	90041
Nayana	Darrah	Santa Cruz	CA	95065
Brian	Boortz	Los Gatos	CA	95030
Barbara	Meislin	Bel Tiburon	CA	94920
Jill	Wiechman	Newbury Park	CA	91320
Matthew	Palmer	Long Beach	CA	90808
Robin	Reinhart	San Diego	CA	92104
Thomas	Rummel	San Diego	CA	92104
Robert	Deferrante	San Fernando	CA	91340
Elmone	Kissling	Eureka	CA	95503
Joyce	Jeckell	Sunnyvale	CA	94087
Freya	Magnusson	San Francisco	CA	94116
Monte And C	Morton	Harbor City	CA	90710
Lilith	Magdalene	Middletown	CA	95461
Christine C.	Jones	Alameda	CA	94502
Susan	Davenport	Simi Valley	CA	93063
Matt	Bender	Cardiff By the	CA	92007
Stephen	Stone	Los Angeles	CA	90063
Michael Ann	Herring	Irvine	CA	92612
Barbara	Lawson	Calimesa	CA	92320
Kyra	Legaroff	Richmond	CA	94804
Christian	Colvin	San Francisco	CA	94105
Annette	Benton	Antioch	CA	94509
Penny	Hall	San Marcos	CA	92078
Michael	Evans	Altadena	CA	91001
Tami	Phelps	Redding	CA	96003
Evan Jane	Kriss	Sausalito	CA	94965
Kyle	Quigley	Playa Vista	CA	90094
Charles	Calhoun	San Francisco	CA	94115
Hill	Blackett III	Piedmont	CA	94611
Bruce	White	Scotts Valley	CA	95067
Jolene	Rogers	Martinez	CA	94553
Leslie	Aisenman	Sylmar	CA	91342
John	Maybury	Moss Beach	CA	94038
Susan	Allen	Livermore	CA	94551
Bertha	Magana-Rios	Ceres	CA	95307
Ethan	Gold	Los Angeles	CA	90039
Diana	Schwab	Santa Monica	CA	90403
Robert	Nunes	Paso Robles	CA	93446
Mary	Sweeney	Creston	CA	93432
Jana	Pendragon	Long Beach	CA	90807

Barry	Zakar	Benicia	CA	94510
Tonya	Dysart	San Diego	CA	92109
Mary Ann	Taylor	Vallejo	CA	94591
Rosemary	Graham-Gard	Manhattan Be	CA	90266
Elliot	Gordon	Irvine	CA	92604
Roberta	Diephouse	Roseville	CA	95661
Barbara	Root	Merced	CA	95340
Michelle	Carter	San Francisc	CA	94110
Richard	Jensen	Solvang	CA	93463
Ruth	Ungar	Oakland	CA	94619
Elaine	Edell	Malibu	CA	90265
John	Pasqua	Escondido	CA	92025
Ruth	Ungar	Oakland	CA	94619
Therese	Finazzo	Los Angeles	CA	90036
Judith	Bushey	San Jose	CA	95135
Piers	Strailey	Quincy	CA	95971
Ruth	Ungar	Oakland	CA	94619
Ruth	Ungar	Oakland	CA	94619
Linda	Adams	Citrus Height	CA	95621
Alfred	Ackerknecht	San Jose	CA	95148
Julie	Amato	Mountain View	CA	94043
Nancy	Danard	Berkeley	CA	94703
K	Siwek	Santa Ana	CA	92705
Susan	Heisler	Patton	CA	92369
Yuka	Persico	Simi Valley	CA	93065
D.	Meyers	Long Beach	CA	90808
Faith	Strailey	Quincy	CA	95971
Allan	Frandsen	Dana Point	CA	92629
Richard	Harvey	Paso Robles	CA	93446
Bernard	Elias	Redondo Beach	CA	90278
Nathan	Tracy	Irvine	CA	92603
Polly	Dallas	Oakland	CA	94607
Phyllis	Butler	Menlo Park	CA	94025
Jean	Haley	Palmdale	CA	93551
Phyllis	Butler	Menlo Park	CA	94025
Phyllis	Butler	Menlo Park	CA	94025
Josef	Kasperovich	San Luis Obis	CA	93406
Robert	Wilkerson	San Diego	CA	92104
Jason	Cunningham	Studio City	CA	91602
Frances	Troll	Santa Monica	CA	90403
David	Tivol	Sunnyvale	CA	94087
Claudy	Assalit	Monterey	CA	93942
Jeffrey	Roughgarden	Redwood City	CA	94062
Thomas	Blair	Los Angeles	CA	90034
Joanne	Sultar	Berkeley	CA	94705
Krista	Nordstrom	San Francisc	CA	94114
Sharon	Lovell	Camarillo	CA	93012
Audrey	Jin	Palos Verdes	CA	90274
Linda	Redenbaugh	San Diego	CA	92104
Angela	Gantos	Tiburon	CA	94920
Michelle	Epstein	Oakland	CA	94607
Stephanie	Moellman	Auburn	CA	95604
Sonia	Alvarez-Oppu	San Jose	CA	95110
Dennis & Jan	Ruby	Woodside	CA	94062
Betty	Kissilove	San Francisc	CA	94122
Jessica	Ramirez	Los Angeles	CA	90045
Sarie	Bryson	Thousand Oal	CA	91361
David	Grothey	Alpine	CA	91901
Serena	Moore	Berkeley	CA	94705

Heide	Doss	El Cajon	CA	92019
Jane	Ahrens	Berkeley	CA	94707
Charles	Wilmoth	San Francisc	CA	94124
Gilbert	Preciado	Diamond Bar	CA	91765
Nick	Leon	San Jose	CA	95125
Roby	Laporte	Crestline	CA	92325
Berna	Nitzberg	Aptos	CA	95003
Anand	Karipineni	Fremont	CA	94538
Jason	Shepherd	Oxnard	CA	93036
Any	Piazza	Guerneville	CA	95446
Lawrence G	Griffin	Oakdale	CA	95361
Nicholas	Lenchner	Santa Rosa	CA	95403
Frank	Mcrae	Los Angeles	CA	90010
Sharon	Mulgrew	Richmond	CA	94801
Cheryl	Tibshirani	Palo Alto	CA	94306
Ivan	Huber	Los Angeles	CA	90045
Timothy	Larkin	San Francisc	CA	94109
C.	Paonessa	Placerville	CA	95667
Terri	Conroy	Santa Barbar	CA	93130
Edwin	Mccready	Los Angeles	CA	90028
Susan	Ogawa	Fort Bragg	CA	95437
Marcia	Flannery	Oakland	CA	94609
Don	Deck	Mammoth Lal	CA	93546
Kathy	Stiles	Santa Barbar	CA	93101
Nancy	Kelly	Oakland	CA	94605
Jake	Gutman	Pacific Palisac	CA	90272
George	Lindelof	Carpinteria	CA	93013
Elizabeth	Halloway	Sacramento	CA	95811
Daphne	Figueroa	San Diego	CA	92107
Mika	Stonehawk	Tustin	CA	92782
Michael	Fischer	Venice	CA	90291
Eudora	Dadpagouh	Riverside	CA	92505
Joan	Armer	San Mateo	CA	94403
Florence	Schwartz	San Francisc	CA	94111
Quanah	Brightman	Richmond	CA	94801
Dale	Wright	Ramona	CA	92065
Dorian	May	Willits	CA	95490
Teresa	Faue	Daly City	CA	94015
Ryland	Madison	Solana Beach	CA	92075
Mercy	Grieco	Fresno	CA	93720
Jeremy	France	West Covina	CA	91792
Nicki	Elliott	Martinez	CA	94553
Nip	Shah	san diego	CA	92129
Bonnie	Pannell	Crockett	CA	94525
Joseph	Mumm	Oakland	CA	94602
Shanti	Williams	Sacramento	CA	95841
April	Hubert	La Honda	CA	94020
Linda	Law	Carmel Valley	CA	93924
Molly	Mendez	Oakley	CA	94561
Judy	Bradford	Rancho Palos	CA	90275
Liza	Siegel	Los Angeles	CA	90025
Sinh	Trinh	Alhambra	CA	91803
Petrea	Sandel	Pasadena	CA	91104
Vincent	Hoagland	Santa Rosa	CA	95404
Christian	Hartmann	North Hollywo	CA	91606
Cory	Anttila	El Dorado Hill	CA	95762
Priscilla	Whitney	Hayward	CA	94541
Paul	Wilkins	Glendale	CA	91203
Margaret	Weimer	San Mateo	CA	94403

Mohan	Jayapal	Los Gatos	CA	95032
Jesse	Agbayani	San Francisco	CA	94116
Jenny	England	San Carlos	CA	94070
Susan	Zaslaw	San Jose	CA	95136
Mark	DiMaria	Los Angeles	CA	90034
Shelly	Gordon	Palo Alto	CA	94306
Barbara	Barr	Torrance	CA	90504
Dale	Hillard	Salinas	CA	93908
Ann	Rushton	Sherman Oak	CA	91423
Arnold	Johnson	Los Angeles	CA	90017
Karen	Wilson	Sacramento	CA	95838
Adrienne	Prasad	Santa Clara	CA	95050
Donna	Kowzan	Moorpark	CA	93021
Lovetta	Burns	Rosamond	CA	93560
Debra	Banes	Sacramento	CA	95834
Brian	Kirk	Orange	CA	92866
Jesse	Delvin	Fremont	CA	94536
Jamie	Rosenblood	Los Angeles	CA	90049
Nancy	Tierney	Pacifica	CA	94044
Junko	Card	Exeter	CA	93221
Steve	Harford	Seal Beach	CA	90740
Caroline	Krewson	Oakland	CA	94611
Dawn	Salisbury	Albany	CA	94706
Linda	Thompson	Sherman Oak	CA	91403
Jennifer	Hayes	Modesto	CA	95350
Joanna	Dewey	Claremont	CA	91711
Robert	Poulsen	Santa Cruz	CA	95062
Ronnie	Maycock	Downey	CA	90241
Vina	Suzuki	Cypress	CA	90630
Greg	Ratkovsky	Oakland	CA	94619
Judy	Hewitt	Stockton	CA	95203
S	Patyk	Aptos	CA	95003
Lyda	Eddington	Los Angeles	CA	90045
Tamara	Paul	Riverside	CA	92509
Phillip	Randall	Woodland Hill	CA	91367
Susan	Himes-Power	San Francisco	CA	94122
Jayson	Ruth	Huntington B	CA	92648
Silva	Harr	Concord	CA	94521
Pamela	Adams	Laguna Beach	CA	92651
Annabelle	Nye	West Hills	CA	91307
Annabelle	Nye	West Hills	CA	91307
Diana	Crispi	Los Angeles	CA	90034
Jerry	Hughes	San Diego	CA	92103
Steven	Aderhold	Fallbrook	CA	92028
Natalie	Cohen	Pasadena	CA	91106
Claudia	Cleaver	Sebastopol	CA	95473
David	Sheridan	Ukiah	CA	95482
Margaret	Copi	Oakland	CA	94602
Joe	Jah	San Francisco	CA	94102
Terry & Mr. M	Horwitz	San Francisco	CA	94122
Joy	Massa	Sausalito	CA	94965
Carol	Sangster	Ojai	CA	93024
Jim	O'Brien	Venice	CA	90291
Penn	Patton	Arcadia	CA	91007
Ed	Teitcher	Aptos	CA	95003
Kerry	Garcia	Aliso Viejo	CA	92656
Marc	Hertz	Van Nuys	CA	91401
Alan	Townsend	San Francisco	CA	94110
Diane	Mckernon	Carmichael	CA	95608

John	Fabris	Orinda	CA	94563
John	Fabris	Orinda	CA	94563
Brian	Pettit	Pacific Grove	CA	93950
Barry	Abshire	Santa Barbara	CA	93110
Stephanie	Clark	Concord	CA	94520
Daniel	Hickey	Cypress	CA	90630
Janet	Seltzer	Albany	CA	94706
Dorothy	Li Calzi	Santa Monica	CA	90404
Bonnie	Wassmer	Lathrop	CA	95330
Charles	Bender	Westminster	CA	92683
Carolyn	Nolan	Fresno	CA	93704
Gregory	Fowler	Mountain View	CA	94039
Eugene	Hinton	Porterville	CA	93257
Kim	Messmer	Santa Clara	CA	95051
Wayne	Steffes	Redding	CA	96001
Brian	Johnson	Castro Valley	CA	94546
Mary	Holquin	Anaheim	CA	92804
Shawn	Prescott	Nevada City	CA	95959
Deborah & Jo	Santone	Pleasant Hill	CA	94523
David	Nolterieke	Laguna Hills	CA	92656
Jeremiah	Anderson	Castro Valley	CA	94552
Barbara	Kirby	Fresno	CA	93711
Adrienne	L	Trabuco Canyon	CA	92679
Doug	Musick	Walnut Creek	CA	94597
Patricia	Wilson	Spreckels	CA	93962
Hali	Rederer	Sacramento	CA	95820
Robert	Kessler	Oakland	CA	94610
Eric	Weiss	Atascadero	CA	93422
Jeri	Pollock	Altadena	CA	91001
Cathryn	Flynn	Vista	CA	92081
Gretchen	Elliott	San Francisco	CA	94127
Emma	Brown	Sacramento	CA	95817
Kathy	O'Brien	Redway	CA	95560
Larry	Emerson	San Diego	CA	92106
Antoine	Gaessler	Palo Alto	CA	94303
Paul	Schlichting	Redondo Beach	CA	90277
John	Wiesner	Castro Valley	CA	94546
Meera	Desai	Oakland	CA	94605
Jeffrey	Hurwitz	San Francisco	CA	94121
Laura	Ice	Sebastopol	CA	95472
Joe	Weis	Reedley	CA	93654
David	Vollmer	Santa Cruz	CA	95060
Anna	Schofield	Los Angeles	CA	90024
Ana	Belle	Santa Clara	CA	94538
Amanda	Wood	San Diego	CA	92101
Geoffrey	Gallegos	San Francisco	CA	94131
Gayle	Dufour	Woodland Hill	CA	91364
Mika	Menasco	San Diego	CA	92104
Kathleen	Waddell	San Luis Obispo	CA	93405
Gail	Mcmullen	Los Angeles	CA	90027
Thomas	Meisenhelder	Huntington Beach	CA	92646
Nancy	Spittler	Lafayette	CA	94549
Michael	Hoover	Los Angeles	CA	90046
Dan	Fogarty	Santa Rosa	CA	95409
Nancy	Robinson	Ridgecrest	CA	93555
Lowell	Young	Mariposa	CA	95338
Sharon	Broberg	Santa Barbara	CA	93140
Priscilla	Rocco	Costa Mesa	CA	92626
Mary	Morris	San Rafael	CA	94901

Julie	Svendsen	Burbank	CA	91505
Michael	Aguilar	Fallbrook	CA	92028
Adrienne	Metter	Santa Barbara	CA	93105
Nancy	Traer	Claremont	CA	91711
D	Davis	Rohnert Park	CA	94928
Carol	McRae	Fairfax	CA	94930
Arthur	Trejo	Madera	CA	93636
Marc	Mullendore	Laguna Hills	CA	92653
Diane Kim	Lazzareschi	Fremont	CA	94555
Anthony	Chico	Duarte	CA	91010
Sandra	Schmaier	Hillsborough	CA	94010
Kermit	Cuff	Mountain View	CA	94041
Lisa	Ash	Carlsbad	CA	92008
David	Peterson	San Diego	CA	92116
Elisabeth	Zenker	Arcata	CA	95521
Philip	Passmore	Rialto	CA	92377
erin	Rowe	Arcata	CA	95521
Emma	Brown	Sacramento	CA	95817
Janet	Kennington	Los Angeles	CA	90077
Valarie	Stengle	San Francisco	CA	94112
Amy	Liebman	Hillsborough	CA	94010
Andy	Carman	Santa Cruz	CA	95060
Susan	Ezequelle	Santa Cruz	CA	95060
Michele	Banks	Castro Valley	CA	94546
Lacey	Levitt	San Diego	CA	92120
Steve	Alford	Long Beach	CA	90802
Cara	Galluzzo	Oxnard	CA	93035
Daina	Manning	Los Angeles	CA	90015
David	Dorn	Livermore	CA	94551
Carole	Martinson	Sonoma	CA	95476
Theresa	Bucher	Tarzana	CA	91356
Jean	Chun	Los Angeles	CA	90045
James	Noordyk	San Diego	CA	92109
Carl	Marantz	Huntington B	CA	92646
Scott	Devries	San Pedro	CA	90731
Maritza	Cabezas	Tarzana	CA	91356
James	Wilson	Placerville	CA	95667
William	Packard	San Diego	CA	92105
Ron	Stormo	Lone Pine	CA	93545
Tom	Roberts	Fresno	CA	93704
Jane	Forbes	Santa Cruz	CA	95060
Anne	Barker	San Rafael	CA	94901
Jo Ann	Kiva	Pasadena	CA	91107
Erin	Sheva	Soquel	CA	95073
Joslyn	Baxter	San Francisco	CA	94118
Jeff	Tyler	Los Angeles	CA	90026
Kathryn	Kelley	Calpine	CA	96124
Kathy	Mayes	Santa Barbara	CA	93108
Marlene	Willauer	Woodland Hill	CA	91364
Marisa	Landsberg	Manhattan B	CA	90266
Reggie	Odom	Northridge	CA	91325
Michael	Mazzarella	Pacific Palisac	CA	90272
Kelly	Kerrigan	San Pedro	CA	90731
James	Ingool	San Diego	CA	92102
Kathryn	Cencirulo	Redlands	CA	92373
Walter	Stauss	Aptos	CA	95003
Elizabeth	Pendleton	Grass Valley	CA	95945
Isabella	La Rocca	Berkeley	CA	94703
Marsha	Maxwell	Walnut Creek	CA	94597

Jordan	White	Roseville	CA	95661
Kraig	Hamady	Carlsbad	CA	92011
Ernesto	Ferrera	Emeryville	CA	94608
Philip	Lariviere	Grass Valley	CA	95945
Louise	Dunlap	Oakland	CA	94609
Carol	Berendsen	Diablo	CA	94528
Mark	Zuckerman	Northridge	CA	91324
Wendy	Monterrosa	Covina	CA	91722
Sheila	Mizrahi	Canoga Park	CA	91304
Lorna	Paisley	Lake Balboa	CA	91406
Lori	Broger-Macke	Northridge	CA	91325
Garry	Scoby	San Diego	CA	92107
Linda	Whitley	San Mateo	CA	94403
Rebel	Kreklow	Fair Oaks	CA	95628
Lorri	Goldman	Fullerton	CA	92833
Sharon	O'Hara	Paradise	CA	95969
David	Walker	Santa Barbara	CA	93105
Jason	Gardner	Berkeley	CA	94707
Billy	Chan	Bakersfield	CA	93312
Lorie	James	Petaluma	CA	94952
Albert	Paulek	Idyllwild	CA	92549
Beverly	Allphi	Berkeley	CA	94703
John	Cloonan	Ventura	CA	93001
John	Golding	Oakland	CA	94619
Adrian	Stier	Escondido	CA	92026
John	Burke	El Sobrante	CA	94803
Christine	Angeles, Md	Burlingame	CA	94010
Rita	Fornataro	Hemet	CA	92543
Michael	Hunter	Woodacre	CA	94973
Dorlene	Russell	Campbell	CA	95008
Don	Swall	Eureka	CA	95501
Laura	Chiang	Chico	CA	95973
N	Lowry	Los Angeles	CA	90042
Chris	Jones	El Segundo	CA	90245
Monique	Biglia	North Hollywood	CA	91601
Mark	Walker	Sunnyvale	CA	94086
Monica	Davila	San Marcos	CA	92078
Julie	Adelson	Santa Monica	CA	90405
Ashley	Foulk	Long Beach	CA	90815
Uta Angelika	Gabler	Santa Rosa	CA	95401
Sharon	Rose	Chico	CA	95926
Cheryl	Linder	Los Angeles	CA	90049
Edgar	Demeo	Palo Alto	CA	94306
Craig	Guenther	Lakeport	CA	95453
Michelle	Palladine	Palm Springs	CA	92262
Kurt	Speidel	San Clemente	CA	92673
Barbara	Cohn	Carlsbad	CA	92010
Herb	Maintzer	South San Francisco	CA	94080
Gary	Jones	San Marino	CA	91108
John	Thomas	Long Beach	CA	90815
Katie	Dunlap	Mountain View	CA	94040
Linda	Palos	Chula Vista	CA	91910
Richard	Anderson	Vallejo	CA	94591
Saran	Kirschbaum	Los Angeles	CA	90035
Ira Steven	Levine	Los Angeles	CA	90028
Rosa	Barragon	Sonoma	CA	95476
Melinda	Oldham	Mission Hills	CA	91345
Heather	Page	Pacifica	CA	94044
Larry	Lima	Campbell	CA	95008

Claudia	Gerber	Cardiff By the CA	92007
Charleen	Steeves	Topanga CA	90290
Nancy	Nilssen	Dublin CA	94568
Maggie	Flower	Del Mar CA	92014
Fionna	Davis	Eureka CA	95502
Hanh	Morgan	San Diego CA	92105
Cynthia	Bartz	Oceanside CA	92054
Kelly	Dunn	Aliso Viejo CA	92656
Sean	Imler	Campbell CA	95008
Camille	Gilbert	Santa Barbar CA	93101
Kevin	O'Byrne	Walnut Creek CA	94595
Terry	Lones	Sacramento CA	95838
Darlene	Norwood	Fairfield CA	94534
Kathryn	Beyers	San Rafael CA	94901
Robyn	Virga	Sacramento CA	95825
Edward	Sullivan	San Francisc CA	94116
David	Britt	El Cerrito CA	94530
Susan	Fox	Fairfax CA	94930
Barbara	Nagy	Torrance CA	90503
Ann	Downey	Laguna Hills CA	92653
L	Talebi	Milpitas CA	95035
Harrison B.	Kinney, Jr.	San Anselmo CA	94960
Sean	Heyliger	Alameda CA	94501
Cornelius	Dykema	Castro Valley CA	94552
Dale	Hoglund	La Quinta CA	92253
Sean	Heyliger	Alameda CA	94501
Wendy	Roberts	Livermore CA	94550
Lonna	Richmond	Muir Beach CA	94965
Tyler	Sullivan	San Francisc CA	94110
Yvonne	Campbell	Chula Vista CA	91910
Chris	Cox	San Jose CA	95110
Dave	Seaborg	Walnut Creek CA	94598
Melissa	Alarcon	Fresno CA	93728
Ron	Parsons	South San Fr CA	94080
Steve	Sketo	Bakersfield CA	93312
Wendee	Lee	Tujunga CA	91042
Lisa	Dearborn	San Jose CA	95126
Jeremy	Lyons	West Hollywo CA	90046
Chad	Saunders	Albany CA	94706
Robert	Schmitt	San Diego CA	92103
Joanna	Katz	Berkeley CA	94702
Karl	Koessel	McKinleyville CA	95519
Phyllis	Levin	Capitola CA	95010
S	Young	Los Angeles CA	90049
Bill	Hessell	Culver City CA	90230
Teal	Mcfarland	Palm Springs CA	92264
Janice	Boyce	Berkeley CA	94707
Patricia	Bohls	Davis CA	95616
Steve & Isabe	Robey	Berkeley CA	94708
Nina	Macdonald	Irvine CA	92617
Astrid	Preston	Santa Monica CA	90403
James	Perkins	Los Angeles CA	90037
Maurice	Edwards	Los Angeles CA	90046
Maggie	Coulter	Sacramento CA	95814
Greg	Bell	Atascadero CA	93422
Rosalba	Cofer	Galt CA	95632
Anthony	Parr	Altadena CA	91001
Michael	Wollman	San Luis Obis CA	93405
John	Cervantes	San Francisc CA	94121

Jason	Bender	Livermore	CA	94550
Karla	Frandsen	San Diego	CA	92128
Jamie	Sawtell	Grass Valley	CA	95945
Douglas	Mccormick	Trabuco Cany	CA	92679
Amy	Robinson	San Rafael	CA	94912
Michelle	Orengo-Mcfar	El Sobrante	CA	94803
Valerie	Thomas	Watsonville	CA	95076
Steve	Thornburg	San Francisco	CA	94131
Juanita	Bellinger	Upper Lake	CA	95485
Nancey	Carter	Topaz	CA	96133
Susan	Schneider	Stockton	CA	95210
Maria	Dambrosio	Bermuda Dur	CA	92203
Lana	Tickner	Bell Canyon	CA	91307
Michael	Mills	Sierra Madre	CA	91025
Pamela	Niles	Upland	CA	91786
Diane	Etchison	San Clemente	CA	92672
Laura	Naismith	Danville	CA	94506
Michelle	Miranda	Santa Cruz	CA	95060
Eileen	Karzen	Los Angeles	CA	90064
Ray	Rodney	Woodacre	CA	94973
Ronald	Garcia	San Luis Obis	CA	93405
Debora	Sayre	Fremont	CA	94536
Urmila	Padmanabhar	Fremont	CA	94538
Joseph	Wigon	Sacramento	CA	95833
Claudia	Linhares	Alameda	CA	94501
Lana	Touchstone	Vallejo	CA	94591
Jeanne	Davenport	Long Beach	CA	90808
Cherie	Connick	Crescent City	CA	95531
Donna	Simms	Valley Glen	CA	91401
Steven	Wright	Sunnyvale	CA	94089
Bonnie Marga	Burke	San Diego	CA	92160
Fritz	Brunner	Walnut Creek	CA	94598
Sharon	Barnes	Encino	CA	91436
Karen	Chinn	Cloverdale	CA	95425
Cynthia	Slavens	Alameda	CA	94501
Deborah	Hoskins	Santa Rosa	CA	95404
James	Barrett	Rio Vista	CA	94571
Haylie	Christante	Nevada City	CA	95959
Nic	Duong	Santa Ana	CA	92705
Paul	Luckman	Oakland	CA	94611
Frank	Sannella	Stockton	CA	95204
Daniel	Carrillo	San Bruno	CA	94066
Monica	Holzmann	Rancho Mirag	CA	92270
Patricia	Pirrone	San Anselmo	CA	94960
Neil	Stanton	Chula Vista	CA	91910
Michael	Ross	El Portal	CA	95318
Barbara	Burgess	Napa	CA	94559
John	Swan	Carlsbad	CA	92009
Jan & Gary	Beeler	Fallbrook	CA	92028
Christopher	Tull	Ventura	CA	93004
Jeanna	Lum	Temecula	CA	92592
Jennifer	Huffsmith-Sh	Indio	CA	92201
Christine	Borje	Los Angeles	CA	90039
Maria	Emmetti	Manhattan Be	CA	90266
Nancie	Evoniuk	Woodland Hill	CA	91364
Nancy	Kingston	Mission Viejo	CA	92692
Danielle	Sawyer	Long Beach	CA	90803
Sheri	Lochner	Monrovia	CA	91016
Sandra	Chrstopher	Burbank	CA	91505

June	Stepansky	Woodland Hill CA	91367
Alan And Carol	Zuckerman	Newhall CA	91321
Celina	Briggs	Boyes Hot Sp CA	95416
Jaya	Fairchild	Los Angeles CA	90065
Victor	Vuyas	San Francisc CA	94109
Cristina	Pinkard	San Jose CA	95125
Mike & Marga	Filip	Mount Shasta CA	96067
Hugh	Ennis	Brisbane CA	94005
Yosh	Yamanaka	Long Beach CA	90803
Luis	Fuentes	Palm Springs CA	92262
Vincent	Louie	San Francisc CA	94118
Beth	Herndobler	Altadena CA	91001
Billy	Jones	El Cerrito CA	94530
Barry	Fitzgerald	Los Gatos CA	95033
Barry	Fitzgerald	Los Gatos CA	95033
Melissa	Hutchinson	Pacific Grove CA	93950
J. Michael "Mi	Henderson	San Luis Obis CA	93405
Andy	Lupenko	Lemon Grove CA	91945
Gwyn	Murray	Menlo Park CA	94025
Cassandra	Voss	Porter Ranch CA	91326
Vincent	Bausano	Richmond CA	94806
Amanda	Silvestri	Crestline CA	92325
Charles	Tribbey	San Luis Obis CA	93405
Dian	Hardy	Sebastopol CA	95472
Leslie	Fiedler	Stanford CA	94305
Thomas	Saito	Burbank CA	91501
David	Haskins	San Diego CA	92105
Judy	Hopkins	Santa Monica CA	90403
Aidan	Humrich	Rohnert Park CA	94928
Patricia	Patterson	Monte Serenc CA	95030
Victor	Vera	Los Angeles CA	90011
Amy	Kiba	Fairfield CA	94534
David	Press	Sherman Oak CA	91403
Kay	Alcorn	Oakland CA	94611
Jesse	Greer	Sacramento CA	95831
Mark	Golembiewski	Pacifica CA	94044
Etta	Robin	Bakersfield CA	93312
Rosemary	Shiolas	Westlake Vlg CA	91361
Mark	Betti	Sherman Oak CA	91423
Martha	Burr	Los Angeles CA	90028
Nancy	Steiner	Los Angeles CA	90039
Donald	Katafiaz	San Marcos CA	92078
Tommi	Watson	Oakland CA	94610
Tom	Slone	Walnut Creek CA	94596
John	Stallone	San Jose CA	95125
Jason	Williams	Carmel By the CA	93921
Kalyani	Roldan	Santa Barbara CA	93101
Elizabeth	Char	Berkeley CA	94702
Jim	Carlstedt	Van Nuys CA	91411
Joan	Trivett	Laguna Beach CA	92651
Randall	Boltz	San Diego CA	92111
Michael	Wisniewski	Hacienda Heights CA	91745
Sergio	Sanchez	Walnut CA	91789
Ellen	Phillips	El Cajon CA	92019
William	Salmon	Carmel Valley CA	93924
Nawal	Tamimi	Richmond CA	94804
Alta	Rudomin	Northridge CA	91324
Julie	Smith	Los Osos CA	93402
Sharon	Camhi	San Francisc CA	94121

Jim	Davis	Glendale	CA	91205
Srira	Zadmehran	San Francisc	CA	94117
Marjorie	Streeter	Alameda	CA	94501
Rhianna	Miller	Santa Rosa	CA	95402
James	Combs	Los Angeles	CA	90068
Sylvia	Augustiniok	San Francisc	CA	94110
David	Clark	Saratoga	CA	95070
Robert	Boughton	Sacramento	CA	95831
Marilyn	Mcmullen	Vallejo	CA	94591
Joan	Raphael	San Diego	CA	92126
Robert And Is	Lata	Paso Robles	CA	93446
Elaine	Needham	Ojai	CA	93023
Joan	Kramer	Los Angeles	CA	90026
Frederick	Brinlee	Hermosa Bea	CA	90254
Cindy	Shamban	Berkeley	CA	94703
Dana	Ahlgren	Rancho Cord	CA	95670
Timothy	Hanson	Santa Monica	CA	90405
Linda	Trevillian	Alhambra	CA	91803
Frank	Cannon	South Lake T	CA	96151
Kris	Head	Garden Grove	CA	92843
Norman	Frank	Berkeley	CA	94707
Shelley	Carlisle	Novato	CA	94947
Maryellen	Redish	Palm Springs	CA	92264
Josh	Sonnenfeld	Oakland	CA	94602
Mariano	Urbani	Villa Park	CA	92861
Christine	Hoex	Santa Rosa	CA	95407
James	Stamos	Saratoga	CA	95070
Elaine	Alfaro	Felton	CA	95018
Erin	Garcia	Sherman Oak	CA	91403
Alice	Labay	Benicia	CA	94510
Tim	Mancini	Fort Bragg	CA	95437
Pat	Goodson	Clearlake Oak	CA	95423
Mckinley	Williams	Los Angeles	CA	90038
Nancy	Heck	Santa Maria	CA	93454
Kathryn	Hindenlang	Huntington B	CA	92646
Lynn	Sentenn	Brea	CA	92821
Brad	Snyder	San Diego	CA	92116
Susan	White	Reseda	CA	91335
Dr Hal	Liu	Fremont	CA	94539
Sarah	Macdonald	Alameda	CA	94501
Bernard	Bouis	San Rafael	CA	94901
Kimberly	Hughes	San Anselmo	CA	94960
Nona	Weiner	San Jose	CA	95127
Thomas	Schroeder	Watsonville	CA	95076
Alice	Savage	San Diego	CA	92128
Stephanie	Stern Lazarus	Los Angeles	CA	90019
Graham	Hamilton	Santa Monica	CA	90405
Blaze	Bhence	Cypress	CA	90630
Brent	Mitchell	San Marcos	CA	92069
Andrea	Whitson	San Jose	CA	95118
Catherine	Vidal	Oxnard	CA	93035
Erin	Foret	Martinez	CA	94553
Erica	Brown	San Andreas	CA	95249
Megan	Rice	Topanga	CA	90290
Ed	Mainland	Novato	CA	94949
Elise	Knight	Claremont	CA	91711
Rifka	Hirsch	Huntington B	CA	92648
Diane	Cotton	Seaside	CA	93955
Lisa	Elsea	San Diego	CA	92107

Nancy	Forbes	Rancho Palos CA	90275
Miriam	Rivers	Porter Ranch CA	91326
Bea	Trenier	Anaheim CA	92802
Darren	Frале	Los Angeles CA	90065
Erika	Karandy	Corte Madera CA	94925
S	Welles	Pine Valley CA	91962
Howard	Cohen	Palo Alto CA	94306
David	Kermode	Boulder Creek CA	95006
Rick	Burns	Petaluma CA	94952
Gabriel	Lautaro	Oakland CA	94610
Ron	Riskin	Santa Barbara CA	93103
Ron	Kaiser	Del Mar CA	92014
Kathleen	Kestelyn	Petaluma CA	94952
Howard	Leonard	Petaluma CA	94952
Ben	Gaffin	Los Angeles CA	90042
Marcia	Lisi	Emeryville CA	94662
Neal	Mock	Truckee CA	96161
Melissa	Grush	Union City CA	94587
Alan	Roberts	Beverly Hills CA	90210
Leslie	Kowalczyk	Sonora CA	95370
Patricia	Bennett	Atascadero CA	93422
Tiia	Mikkelsaar	Aliso Viejo CA	92656
Robert	Sodervick	San Francisco CA	94103
Savannah	Green	Mendocino CA	95460
Andrea	Ferrari	Oceanside CA	92056
Ann Catherine	Keirns	Castro Valley CA	94546
Trishia	Maruri	Oakland CA	94607
Howard	Spivak	Fair Oaks CA	95628
Lawrence	Carbary	San Francisco CA	94131
Paul	Gardner	San Jose CA	95128
Edmond	Green	Los Alamitos CA	90720
James	Foley	Canoga Park CA	91304
Leslee	McPherson	San Mateo CA	94403
A	Marsh	Escondido CA	92027
Mary	Scibek	Vacaville CA	95687
Diane	Brazil	Rancho Cordc CA	95670
Joan	Klose	Newport Beach CA	92663
Trishia	Maruri	Oakland CA	94607
Trishia	Maruri	Oakland CA	94607
Trishia	Maruri	Oakland CA	94607
Trishia	Maruri	Oakland CA	94607
Jenny	Skoble	Half Moon Bay CA	94019
Kathleen	Morgan	Chula Vista CA	91911
Donna	Daane	San Diego CA	92126
Courtney	Gartin	San Jose CA	95120
Clydell	Peairs	Hayward CA	94545
Mabel	Ayotte	Santa Ana CA	92704
Lawrence	Lipkind	San Francisco CA	94133
Patti	Fink	Vacaville CA	95687
Diane	Berliner	Los Angeles CA	90046
Sally	Nelson	Berkeley CA	94703
Susan	Karlin	San Diego CA	92128
Bruce	McGraw	San Diego CA	92104
Christina	Montana	Coarsegold CA	93614
Nina	Utigaard	Richmond CA	94804
Anne	Williams	Ben Lomond CA	95005
Meg	Newman	San Francisco CA	94122
John	Talley	Woodside CA	94062
Jillian	Unger	Sacramento CA	95820

Lucia	Dahlstrand	Monterey	CA	93940
Marta Lynn	Freeman-stee	Moreno Valley	CA	92555
Jessica	Denham	Burbank	CA	91506
Michael	Handforth	San Diego	CA	92115
Victoria	Jensen	Santa Monica	CA	90405
Jerry	Schneider	Los Angeles	CA	90065
Gail	Owensmith	Long Beach	CA	90806
Colleen	Rodger	El Sobrante	CA	94803
Susan	Croce	Sunnyvale	CA	94087
Michele	Roma	Concord	CA	94520
James	Columbia	Bakersfield	CA	93306
Yvonne	Oelkers	Visalia	CA	93292
David	Mackey	Martinez	CA	94553
Mara	Hornby	Laguna Nigue	CA	92677
Rhonda	Cera	Emeryville	CA	94608
Ann	Johnson	Grass Valley	CA	95949
Diane	Bolman	Novato	CA	94949
Ricardo	Vasallo	Danville	CA	94526
Lacey	Hicks	Union City	CA	94587
Laurie	Mccann	Santa Cruz	CA	95062
Patricia	Duncan	Solvang	CA	93463
Kathleen	Brown	San Francisc	CA	94109
Jonathan	Wieder	Berkeley	CA	94702
Karen	West	Tustin	CA	92780
Alan	Carlton	Alameda	CA	94501
Elora	Hartmann	Paso Robles	CA	93447
Bret	Smith	Santa Cruz	CA	95063
Marilyn	O'Malley	Petaluma	CA	94952
Ken	Gilliland	Tujunga	CA	91042
Michael	Allen	Santa Barbar	CA	93105
Alicia	Kern	Palos Verdes	CA	90274
Donna	Carr, M.D.	Encinitas	CA	92024
Chad	Johnson	Long Beach	CA	90806
Yvette	Fallandy	Santa Rosa	CA	95404
Micah	Mcintyre	Valley Center	CA	92082
Brent	Riggs	Inglewood	CA	90302
Ravid	Raphael	Santa Barbar	CA	93111
Matthew	Coleman	Oakland	CA	94611
Giada	Gattoni Grico	Mountain Vie	CA	94043
Oma	Ford	Lincoln	CA	95648
Christine	Tanaka	Los Angeles	CA	90025
Christine	Tanaka	Los Angeles	CA	90025
Christine	Tanaka	Los Angeles	CA	90025
Arlyne	London-Kessl	Oakland	CA	94610
Marianne	Cali	Sunnyvale	CA	94087
Luke	Breit	Sacramento	CA	95818
Stewart	Winchester	Richmond	CA	94805
Tim	Hill	Oakland	CA	94608
Douglas	Estes	San Francisc	CA	94118
Richard	Schwartz	Berkeley	CA	94707
Deborah	Remy	Carmel Valley	CA	93924
Charles	Winter	Berkeley	CA	94704
Geralynn	Cherbonnier	Modesto	CA	95355
Geralynn	Cherbonnier	Modesto	CA	95355
Justine	Bellock	Long Beach	CA	90804
Alyce	Gershenson	Belmont	CA	94002
Heidi	Bean	Newport Beac	CA	92663
Jeanne	Hirshfield	Rancho Mirag	CA	92270
Darrell	Robinson	Nevada City	CA	95959

Marc	Gregory	Beverly Hills	CA	90209
Kimberlee	Stryker	San Francisco	CA	94110
Diane	Vierra	Yucaipa	CA	92399
Howard	Belove	Petaluma	CA	94952
Paul	Bechtel	Redlands	CA	92373
Joanne	Doherty	Simi Valley	CA	93065
Darlene	Wyatt	Lemon Grove	CA	91945
Elaine	Boles	Santa Cruz	CA	95062
Anne	Dugaw	Costa Mesa	CA	92627
Karen	Perry	Yucca Valley	CA	92284
Alex	Silverio	San Jose	CA	95130
Tazz	Monroe	Sylmar	CA	91342
Gretchen	Sauer	San Leandro	CA	94577
Laurie	Neill	Smith River	CA	95567
Robert	Wallace	Whittier	CA	90602
Thomas	Dublin	Berkeley	CA	94704
Evelyn	Greenwald	San Luis Obispo	CA	93401
Ava	Evans	Encino	CA	91436
Julie	Veney	Scotts Valley	CA	95066
Janice	Thompson	Lake Forest	CA	92630
Michelle	Mackenzie	San Carlos	CA	94070
Richard	Shepard	Diamond Bar	CA	91765
Chris	Ceriale	Vallejo	CA	94590
Robert	Harless	Davis	CA	95616
Gloria	Towers	Oceanside	CA	92054
James	Patton	Los Altos	CA	94024
Gloria	Towers	Oceanside	CA	92054
Mary	Rojeski	Santa Monica	CA	90405
Jana	Niernerberger	Santa Rosa	CA	95401
Berkeley	Gardner	Pasadena	CA	91105
Jonathan	Sampson	Santa Rosa	CA	95404
Lynn	La Count	Occidental	CA	95465
Jeffrey	Stone	Yreka	CA	96097
Bea	Payumo	Tracy	CA	95377
Stephen	Andersen	San Mateo	CA	94404
Jacquelyn	Evans	Berkeley	CA	94708
Matthew	Rivers	Porter Ranch	CA	91326
Kevin	Schader	Pleasant Hill	CA	94523
Tera	Rapp	Santa Margarita	CA	93453
Paulette	Forest	Soquel	CA	95073
Susan	Walp	Pasadena	CA	91103
Johnny	Blades	Venice	CA	90291
Julie	Zimmerman	Sherman Oaks	CA	91423
George	Latta	Visalia	CA	93277
Marilynn	Smith	San Jose	CA	95127
Sharon	Torrisi	Hermosa Beach	CA	90254
George	Meskus	Richmond	CA	94804
Richard	Hubacek	Little River	CA	95456
Oakley	Norton	Redlands	CA	92373
Georgia	Ireland	Scotts Valley	CA	95066
Angelique	Brake	San Jose	CA	95111
Kevin	Fistanic	Los Angeles	CA	90066
Garrett	Barton	Rosemead	CA	92688
Stephen	Bohac	Twain Harte	CA	95383
Diane	Beglin	Glendale	CA	91208
Terence	Pearce	Los Angeles	CA	90066
Wendy	Hinsberger	Santa Ana	CA	92705
David	Weinstein	West Hollywood	CA	90046
Robert	Spotts	Oakley	CA	94561

William	Rothman	Belvedere	CA	94920
Carol	Mone	Trinidad	CA	95570
Pavel	Skaldin	San Francisc	CA	94133
Christine	Caliandro	Santa Rosa	CA	95404
Toni	Littlejohn	Point Reyes S	CA	94956
Maxwell	Chaplin	Carmel	CA	93923
Gabriel	Graubner	Santa Rosa	CA	95404
James	Hamilton	Palos Verdes	CA	90274
Valerie	Romero	Quincy	CA	95971
Paul	MacDonald	Emeryville	CA	94608
Carly	Ritter	Marina Del Re	CA	90292
Dana	Mantle	Los Gatos	CA	95032
James R	Monroe	Concord	CA	94521
Bob	Velez	Ventura	CA	93006
Faye	Easley	Burbank	CA	91502
Kimberly	Notary	Modesto	CA	95350
Sheqib	Tukhy	Fremont	CA	94536
Lynn	Cohen	Agoura Hills	CA	91301
Katie	Stewart	Nipomo	CA	93444
Lynn	Cohen	Agoura Hills	CA	91301
Hal	Forsen	San Clemente	CA	92672
Kristy	Milman	Coto De Caza	CA	92679
Reine	Flexer	Palo Alto	CA	94306
Maureen	Walsh	Redondo Bear	CA	90277
Liya	Schwartzman	Sacramento	CA	95820
Lucy	Larom	San Diego	CA	92102
Laura	Kielman	Sacramento	CA	95818
Jeannie	Clements	Fremont	CA	94536
Cindy	Benner	San Diego	CA	92106
Ann	Rovere	San Francisc	CA	94112
Irene	Kane	Oakland	CA	94605
Gloria	Donoohue	Larkspur	CA	94939
Kass	Schwin	Carmel	CA	93923
Julia	Ulrich	Tracy	CA	95377
Barbara	Strother	Sonora	CA	95370
Golda	Michelson	Fairfax	CA	94930
Iain	Wade	Los Angeles	CA	90049
Julie	Kloper	Santa Clara	CA	95050
Erin	Howard	Oakland	CA	94607
Jill	Crenshaw	Los Angeles	CA	90027
Laura	Overmann	Burlingame	CA	94010
Bert	Selig	Monrovia	CA	91017
Sudia Paloma	Mcaleb	Berkeley	CA	94705
Peter	Friedman	South Pasade	CA	91030
Elizabeth	Jache	Lemon Grove	CA	91945
Shirley	Harris	Willits	CA	95490
Diane	Krell-Bates	San Diego	CA	92122
David	Mccoard	El Cerrito	CA	94530
Suzanne	Donnelly	Pomona	CA	91768
Del Rey	Pacheco	Chula Vista	CA	91913
Shannon	Myers	Oakland	CA	94608
Helen	Wright	Dana Point	CA	92629
Ronald	Bogin	El Cerrito	CA	94530
Bernard	Wooldridge	Clovis	CA	93619
Hilary	Jones	Santa Rosa	CA	95404
Holiday	Lammon	Palmdale	CA	93550
Laura	Flanders	Glendora	CA	91741
Connie	Whalley	Topanga	CA	90290
Valerie	Nesbitt	Paradise	CA	95969

Val	Marshall	Fort Bragg	CA	95437
Anja	Kollbach	Menlo Park	CA	94025
Therese	Neustaedter	Hermosa Bea	CA	90254
John	Peterson	Pacifica	CA	94044
Gail	Bedinger	Rio Vista	CA	94571
Linda	Ray	San Francisc	CA	94110
Cynthia	Tuell	Upland	CA	91786
Lamar	Olk	Gualala	CA	95445
Walter	Scott	Sacramento	CA	95814
William	Manser	Hanford	CA	93230
Judith	O'Rourke	San Anselmo	CA	94960
Jim	Perry	Santa Rosa	CA	95402
John	Boyd	North Highlar	CA	95660
Ramona	Teagarden	Upper Lake	CA	95485
Alex	Stromeyer	San Andreas	CA	95249
Vic	DeAngelo	San Francisc	CA	94121
Gariesue	Gordon	North Hills	CA	91343
Raymond	YUle	Fullerton	CA	92835
Gerald	Wise	Bishop	CA	93514
Glen	Deardorff	Castro Valley	CA	94546
Lynn	Learch	Royal Oaks	CA	95076
Karynn	Merkel	Eureka	CA	95503
Cynthia	Coley	Lake forest	CA	92630
Mary	Wiener	Carpinteria	CA	93013
Gary	Hamel	Oceano	CA	93445
Kimberly Ann	Halizak	Los Angeles	CA	90068
Lola	Lynch	Port Hueneme	CA	93041
George	Smith	Aptos	CA	95003
Joe	Mueller	Kentfield	CA	94904
Deborah	Atwell	Altadena	CA	91001
Carol	Ng	Los Angeles	CA	90026
Charles	Schmitt	San Diego	CA	92103
Peggy	Loe	Magalia	CA	95954
Jackie	Pomies	San Francisc	CA	94122
Judith	Wright	Sacramento	CA	95816
Laurel	Woodward	Cerritos	CA	90703
Emily	Yang	Arcadia	CA	91007
Jaime	Baldner	Foster City	CA	94404
Karen	Mayer	Eureka	CA	95503
Chad	Ryan	Grass Valley	CA	95949
James	Ashcraft	Sacramento	CA	95825
Valjean	Oneill	San Diego	CA	92109
Kenneth	Daponte	Rancho Palos	CA	90275
Cynthia	Nakashima	Piedmont	CA	94611
Alex	Stephanovich	San Francisc	CA	94131
Tammy	Negelein	Long Beach	CA	90814
Neil	Resico	San Lorenzo	CA	94580
Joseph	Keene	West Hollywo	CA	90069
Carol	Gajewski	Carlsbad	CA	92011
Michael	Smith	Newbury Park	CA	91320
Chuck	Karp	Palm Desert	CA	92261
Janeen	Porter	Pleasanton	CA	94588
Brenda	Brazil	Healdsburg	CA	95448
Ron	Fransz	Hermosa Bea	CA	90254
C	Ruth	Stanford	CA	94305
Peter	Kerr	Davis	CA	95616
Eric	Decker	Scotts Valley	CA	95066
Brent	Larsen	San Diego	CA	92103
Harry	Blumenthal	Eureka	CA	95501

Dj	Brown	Rocklin	CA	95765
Phyllis	Bogartz	Tarzana	CA	91335
Birthe	Miller	Oceanside	CA	92057
Matthew	Johnson	Anaheim	CA	92801
Joan	Murray	Los Angeles	CA	90066
Elisabeth	Rothenberger	Novato	CA	94949
Terrance	San Cartier	Santa Maria	CA	93455
Sylvia	Selverston	San Diego	CA	92111
Judy	Malouf	Newport Beach	CA	92660
Dennis	St.Pierre	Forest Knolls	CA	94933
Wendy	Lewis	Brentwood	CA	94513
Amjed	Manasrah	Riverside	CA	92503
Constantine	Bogios	Walnut Creek	CA	94597
Margarita	Perez	Sylmar	CA	91342
Ruth	Sohn	Los Angeles	CA	90019
Vicki	Lee	El Sobrante	CA	94803
Amarie	Alcala	Manteca	CA	95336
John	Delgado	San Martin	CA	95046
Marci	Levine	Los Angeles	CA	90046
Margaret	Demott	Sacramento	CA	95822
Morris	Walsh	Carmichael	CA	95608
Edward	Kicklighter	Spring Valley	CA	91977
Greta	Wanyik	Long Beach	CA	90813
Janelle	London	Menlo Park	CA	94025
Sara	David-Feyh	Ventura	CA	93003
Alec	Taratula	Alhambra	CA	91801
Kelli	Lent	Alameda	CA	94501
K	Hildner	Goleta	CA	93117
Jami	Pillow	Pasadena	CA	91105
Jeffrey	Streicher	Long Beach	CA	90808
Melinda	Cotton	Long Beach	CA	90803
Felipe	Ortiz	Lake Elsinore	CA	92530
Alison	Schulman	Huntington B	CA	92648
Rick	Schulze	Redwood City	CA	94065
Patrick	Apana	Garden Grove	CA	92841
Roy	Rosenblatt	Sherman Oak	CA	91403
Cynthia	Parnell	San Diego	CA	92111
Justin	Little	Burlingame	CA	94010
Herb	Dunham	Carlsbad	CA	92008
Stephanie	Orozco	Los Angeles	CA	90041
Thomas	Knecht	Avila Beach	CA	93424
Joseph Regini	Cota	Pasadena	CA	91106
Mark	Hanisee	Riverside	CA	92506
Catherine	Mcbride	Santa Rosa	CA	95405
Michael	Kemper	San Francisc	CA	94109
Richard	Beaudreau	Angels Camp	CA	95222
John	Gasperoni	Berkeley	CA	94703
Katherine	Prince	Los Angeles	CA	90019
Deborah	Shields	Laguna Beach	CA	92651
Doreen	Delgado	Newhall	CA	91321
Adam	Bernstein	Los Angeles	CA	90012
Joseph	Zondlo	Santa Rosa	CA	95409
Zora	Hocking	Santa Rosa	CA	95401
Joe	Michael	Berkeley	CA	94702
Amanda	Blatchford	Walnut Creek	CA	94598
Joe	Michael	Berkeley	CA	94702
Chris	Gomez	Van Nuys	CA	91401
John	Baker	Orange	CA	92866
Rachel	Rodriguez	San Francisc	CA	94108

K	Krupinski	Los Angeles	CA	90042
Eve & John	Duddy	Capistrano Be	CA	92624
Samantha	Johnson	Carlsbad	CA	92009
Therese	Debing	Pacific Grove	CA	93950
Kristin	Goble	Sacramento	CA	95821
Pete	Monreal	Azusa	CA	91702
Jed	Fuhrman	Topanga	CA	90290
David	Shreve	El Segundo	CA	90245
Jed	Fuhrman	Topanga	CA	90290
Christina	Strother	Elk Grove	CA	95757
Stephen	Vodantis	Santa Monica	CA	90403
Dave	Field	Santa Cruz	CA	95060
Chelsea	Emerson	Sacramento	CA	95816
Hugh	Harris	Santa Rosa	CA	95403
Pat	Daniels	Spring Valley	CA	91977
David	Sarricks	Running Sprin	CA	92382
David	Sarricks	Running Sprin	CA	92382
Mara	Williams	Sonoma	CA	95476
Barb	Weber	Menlo Park	CA	94025
Frederique	Joly	Venice	CA	90291
Brandon	Moon	Arroyo Grand	CA	93420
Lori	Smith	Cathedral City	CA	92234
Syd	Rumford	Long Beach	CA	90808
Susan	Hanger	Topanga	CA	90290
Judith	Anderson	Long Beach	CA	90807
Louis	Bennett	Berkeley	CA	94707
Chris	Soper	Pacific Grove	CA	93950
Ken	Windrum	Los Angeles	CA	90004
Charles	Blair	Lompoc	CA	93436
Vicki	Fellows	North Hollywood	CA	91605
Roberta	Stern	Oakland	CA	94618
David	Wytock	San Jose	CA	95125
Marsha	Lowry	El Sobrante	CA	94803
Elizabeth	Osborne	Oceanside	CA	92058
Marilyn	Price	Mill Valley	CA	94941
Kevin	Abrahamian	Glendale	CA	91202
Fran	Howard	San Diego	CA	92103
Donald	Peters	North Hills	CA	91343
Sharon	Laabs	La Jolla	CA	92037
Lawrence	Lujan	Pico Rivera	CA	90660
David	Hammond	Willits	CA	95490
Greg	Demasi	Concord	CA	94524
Laurel	Neufeld-Willie	Arroyo Grand	CA	93420
Maria Elena	Hernandez	Los Angeles	CA	90048
Ana	Herold	Pacifica	CA	94044
Rick	Maguire	Los Angeles	CA	90044
Sarah	Abrell	Carlsbad	CA	92010
Bruce	Spring	Los Angeles	CA	90065
Virginia	Digilio	San Leandro	CA	94577
Penelope	Heintz	Cedar Ridge	CA	95924
Alexandre	Kaluzhski	San Diego	CA	92128
David	Sowerwine	Menlo Park	CA	94025
Brendan	Hughes	Joshua Tree	CA	92252
Barbara	Frances	Aromas	CA	95004
J	Angell	Rescue	CA	95672
Gloria	Soto	Los Angeles	CA	90046
Mitch	Dalition	San Francisco	CA	94117
Mark	Lewis	Carlsbad	CA	92009
Jaime	Becker	Berkeley	CA	94702

Emily	Brown	La Jolla	CA	92037
Robin	Long	Belmont	CA	94002
Ruth	Judkins	Altadena	CA	91001
Melvyn	Nefsky	Marina Del Re	CA	90292
Skye	Van Raalte-Hi	Tujunga	CA	91042
Kevin	Kennedy	Camarillo	CA	93012
Michelle	Adams	Saratoga	CA	95070
Marla	Mcfadin	Oakland	CA	94601
P	Beiz	Oakland	CA	94611
Lynda	Mcdaniel	Sebastopol	CA	95472
Lin	Griffith	Altadena	CA	91001
Audrey	Okubo	San Jose	CA	95129
Dana	Adler	Fallbrook	CA	92028
Emil	Reisman	Encino	CA	91436
Glenn	Sisson	San Francisc	CA	94118
Scott	McKay	Hayward	CA	94545
Vicki	Bookless	San Luis Obis	CA	93405
Steven	Bal	San Diego	CA	92108
Gearry	Buydos	Mission Viejo	CA	92691
John	Womack	Placentia	CA	92870
Genevieve	Deppong	Los Altos	CA	94024
Ray & Kristine	Lamanno	Danville	CA	94506
Kathlyn	Robbins	San Diego	CA	92115
Cathy	Holden	Sacramento	CA	95864
Hillary	Ostrow	Encino	CA	91316
Michelle	Orengo-McFar	El Sobrante	CA	94803
Nick	Bilardello	Soquel	CA	95073
George	Burnash	Rancho Cordc	CA	95670
Jess	Graffell	Yucaipa	CA	92399
Tim	Nichols	Oakland	CA	94605
Marge	Barry	Pittsburg	CA	94565
Jayne	Crofoot	Kingsburg	CA	93631
Kelley	Carroll	Truckee	CA	96161
Milinda	Scott	Laguna Nigue	CA	92677
Edie	Bruce	El Cerrito	CA	94530
Margaret	Buck	San Clemente	CA	92672
Elaina	Martin	Beverly Hills	CA	90212
Tom	Fitzpatrick	West Hollywo	CA	90048
L	Douglas	Penngrove	CA	94951
Patricia	Mccauley	Anaheim	CA	92807
B	Yoldas	Ramona	CA	92065
Gloria	Purcell	Belmont	CA	94002
Jacki	Hunter	Hollywood	CA	90068
Deborah	Chill	Yucaipa	CA	92399
Marcia	Kolb	Oakland	CA	94618
Wendy	Diamond	Berkeley	CA	94707
Mark	Gallegos	Los Angeles	CA	90033
Walter	Brown	Roseville	CA	95661
Michelle	Murray	Chico	CA	95926
Joel	Altman	Berkeley	CA	94707
Elizabeth	Shen	Mountain Vie	CA	94043
Diana	Zimmerman	Los Angeles	CA	90045
Linda	Valdes	Soquel	CA	95073
Mark	Walkowiak	Burbank	CA	91506
David	Peterson	San Jose	CA	95112
Michael	Tanger	West Covina	CA	91792
Darrell	Rolstone	Larkspur	CA	94939
Nancy	Mendiburu	San Diego	CA	92154
Robin	Steudle	Laguna Wood	CA	92637

Hank	Schlinger	Glendale	CA	91201
Suzanne	Mcmillan	Berkeley	CA	94703
Sharon	Porter	Paradise	CA	95969
Robin	Rabens	Escondido	CA	92026
Edh	Stanley	Sacramento	CA	95823
Deborah	Williams	Gardena	CA	90249
Bernard	Scoville	Sacramento	CA	95833
Steven	Twohy	San Jose	CA	95139
Lynda	Lynch	Alameda	CA	94501
Linda	Stein	Oakland	CA	94610
Maureen	Plimier	Oakland	CA	94611
Jennifer	Russell	Santa Monica	CA	90403
Ann	Isolde	Santa Monica	CA	90403
Judith	Turner	Marina Del Re	CA	90295
Douglas	Snyder	Laguna Beach	CA	92651
Steve	Claas	Cupertino	CA	95014
Ryan	W.	Fontana	CA	92336
Robert And P	Gunther	Davis	CA	95616
Jen	Harrison	San Francisc	CA	94131
Sarah	Stevens	Martinez	CA	94553
Peter	Robinett	San Francisc	CA	94114
Michael	Kohnen	San Pablo	CA	94806
Steve	Baringer	Orange	CA	92869
Joan	Borame	El Cerrito	CA	94530
Margaret	Anderson	Sacramento	CA	95826
Larisa	Cummings	Berkeley	CA	94703
David	Holtegaard	San Bernardi	CA	92404
Patricia	Ansell	Encinitas	CA	92024
Norm	Wilmes	Yuba City	CA	95991
Mary	Waitz	Berkeley	CA	94704
Blake	Rothschild	Oakland	CA	94610
Edward	Moen	Long Beach	CA	90807
Kathleen	Djordjevich	Menlo Park	CA	94025
Alan	Schwartz	Oxnard	CA	93035
Judy	Beachler	Davis	CA	95618
Beatrice	Howard	Berkeley	CA	94702
Josh	Forge	Lake Balboa	CA	91406
Betty	Peschke	Saratoga	CA	95070
Toni	Woodruff	Sunnyvale	CA	94087
Lydia	Moore	Laguna Beach	CA	92651
Stacy	Hall	San Diego	CA	92104
Julie	Sicaud	Sebastopol	CA	95472
Wendy	Brueder	Glendale	CA	91206
Victor	Nepomnyash	North Hills	CA	91343
Laura	Zaydel	Moss Beach	CA	94038
Susanna	Marshland	Kensington	CA	94707
Paul	Morse	Walnut Creek	CA	94595
Sarah	Ichioka	Berkeley	CA	94703
Martha	Booz	El Sobrante	CA	94803
Karyn	Kennedy	Novato	CA	94949
lisa	gold	los angeles	CA	90048
Philip	Russell	Los Altos Hills	CA	94024
Sandra	Geist	Santa Cruz	CA	95060
Jerry	Horner	Walnut Creek	CA	94595
Ronnie	Perry	Twentynine P	CA	92277
Julie	Crew	San Francisc	CA	94114
Diana	Ashurst	Corning	CA	96021
Tara	Sanchez	Long Beach	CA	90807
Dionne	Carlson	San Diego	CA	92116

Bria	Pilates And W	Costa Mesa	CA	92627
Robert	Zimmerman	Tahoe City	CA	96145
James	Talbot	Granada Hills	CA	91344
Kim	Krupinski	Sherman Oak	CA	91403
Gary & Mary	Shallenberger	Paradise	CA	95969
Jeffrey	Powell	Santa Monica	CA	90405
Julia	Frisk	Plumas Lake	CA	95961
Erica	Stanojevic	Santa Cruz	CA	95060
Luisa	Navejas	Mount Shasta	CA	96067
Dorothy	Clazie	Petaluma	CA	94954
Margaret	Hasselman	Albany	CA	94706
Angela	Herschel	West Hills	CA	91307
Carol	McMahon	Placerville	CA	95667
George	Steinitz	Campo	CA	91906
Frances	Alet	Calabasas	CA	91302
Carol	Long	Santa Cruz	CA	95060
Walter	Juchert	Santa Rosa	CA	95409
Rolando	Arango	Fairfield	CA	94534
Heidi	Lim	San Francisco	CA	94107
Rhonda	Sancibrian	Merced	CA	95340
Avila	Lowrance	Grass Valley	CA	95945
Georgia	Labey	La Mesa	CA	91942
Lisa	Caloh	Bonita	CA	91902
Karen	Hellwig	Los Angeles	CA	90056
Nancy	Esajian	Oakland	CA	94619
Barbara	Yungert	Santa Rosa	CA	95404
Susan	McLean	Ukiah	CA	95482
Patricia	B	Laguna Beach	CA	92651
Eric	Estrin	Oak Park	CA	91377
Katherine	Lewis	Moorpark	CA	93021
Tonya	Dysart	San Diego	CA	92109
Joanne	Rovno	San Mateo	CA	94402
Edward	Cavasian	Palo Alto	CA	94303
Herman	Chaney	Oakland	CA	94612
Anna	Utzman	Mill Valley	CA	94941
Terrill	Kelly-Barrows	Simi Valley	CA	93063
Elliotte	Skinner	San Diego	CA	92104
Thomas	Ferrito	Los Gatos	CA	95030
Thomas	Ferrito	Los Gatos	CA	95030
Rose	Miksovsky	Oakland	CA	94618
Annamarta	Dostourian	Berkeley	CA	94702
Al	Harris	Oakland	CA	94612
Chris	Degoeas	Cerritos	CA	90703
Jolene	Vadillo	San Marcos	CA	92069
Deborah	Holcomb	Los Angeles	CA	90025
Jeffery	Barrett	McKinleyville	CA	95519
Scott	Barlow	Sunnyvale	CA	94087
Elizabeth	Desler	Camino	CA	95709
D	Stoeffler	Brentwood	CA	94513
Noelle	Filice-Smith	Loomis	CA	95650
Bill	Legere	Clovis	CA	93611
Edward	Syrett	Menlo Park	CA	94025
Delilah	Butler	Inglewood	CA	90301
Delilah	Butler	Inglewood	CA	90301
Delilah	Butler	Inglewood	CA	90301
Michael	Parry	Escondido	CA	92025
William	Cuppoletti	Penngrove	CA	94951
Steve	Hoelke	Claremont	CA	91711
Alan	Socol	Los Angeles	CA	90019

Terry	King	Gualala	CA	95445
Peter	Volz	Canoga Park	CA	91303
Jennifer	Sarff	San Diego	CA	92103
Lloyd	Reynolds	Fountain Vall	CA	92708
Timur	Mukminov	Mountain View	CA	94043
Jane	Biggins	Ukiah	CA	95482
Tom	Simonian	San Francisc	CA	94110
Bill	Britton	Livermore	CA	94550
Julie	Arnold	Penryn	CA	95663
Maraiel	Ruth	Nevada City	CA	95959
Brian	Humble	Redding	CA	96003
Anne	Leong	Oakland	CA	94611
Lareine	Normandin	Laguna Beach	CA	92651
Ruth	Molina	Temecula	CA	92592
Lou Anne	Insprucker	La Canada	CA	91011
Lois	Bacon	Freedom	CA	95019
Elleyne	Beals	Tahoma	CA	96142
Nancy	Biggins	Ukiah	CA	95482
Deb	Federin	La Jolla	CA	92037
Juan	Molina	Temecula	CA	92592
Suzanne	Deerlyjohnson	Long Beach	CA	90806
Steve	Sugarman	Malibu	CA	90265
Edward	Costello	Santa Monica	CA	90402
Cleve	Nash	Santa Margar	CA	93453
Jack	Phillips	Roseville	CA	95747
Beverly	Spector	San Francisc	CA	94104
Melanie	Zeller	Walnut	CA	91789
Jp	Townsend	Los Angeles	CA	90077
Achilles	Aiken	Whittier	CA	90601
Carolyn	Bigger	El Cajon	CA	92020
Maria	Kalscheuer	Saint Helena	CA	94574
Holly	Asamura	Oceanside	CA	92057
Richard	Milgram	Boulder Creek	CA	95006
Joe	Pardee	Pasadena	CA	91107
Juan and Mar	Balboa	San Jacinto	CA	92583
Ojars	Kratins	Walnut Creek	CA	94595
Mark	Schilling	Los Angeles	CA	90077
Elizabeth	Ramsey	Davis	CA	95616
David	Robinson	Santa Cruz	CA	95062
Gloria	Dralla	Los Altos	CA	94022
Linda	Avarello	San Clemente	CA	92672
David	Donner	San Francisc	CA	94129
William	Mitchell	Oakland	CA	94619
Peter	Slattery	Salinas	CA	93907
Marc	Weissman	Escondido	CA	92026
Mary	Betlach	San Francisc	CA	94131
Sue	Williard	San Francisc	CA	94122
Phil	Hinkle	San Diego	CA	92117
Rebecca	Wong	Castro Valley	CA	94546
C	O	Fair Oaks	CA	95628
Cynthia	Bristow	Placentia	CA	92870
Joel	Eisenberg	Richmond	CA	94805
Jeffrey & Gwe	Whittle	Albany	CA	94706
Janice	Elliott	Upland	CA	91786
Cheryl	Ku	Moraga	CA	94556
Miriam	Vivian	Bakersfield	CA	93311
kelly	Lilburn	Los Osos	CA	93402
R	Kadden	West Hills	CA	91308
Natalie	Blasco	Anderson	CA	96007

Randall	Lee	Fresno	CA	93722
Tim	Brady	Aliso Viejo	CA	92656
Jennifer	Parker	Los Angeles	CA	90068
Deborah	Giordano	Novato	CA	94949
Anne	Barr	Kentfield	CA	94904
Ben	Discoe	Oakland	CA	94609
Sharlene	Goldman	Murrieta	CA	92562
Mary J	Wood	San Luis Obis	CA	93405
Gemma	Scharfenberg	Redondo Bea	CA	90277
Gemma	Scharfenberg	Redondo Bea	CA	90277
Fred	Geiger	Santa Cruz	CA	95060
Daniel	Chavez	Napa	CA	94558
Daniel	Chavez	Napa	CA	94558
Christina	Dilko	Novato	CA	94949
Don	Richards	Valley Center	CA	92082
Ava	Kearney	Jackson	CA	95642
Fred	Geiger	Santa Cruz	CA	95060
David	Walters	Grass Valley	CA	95949
Edwin	McCready	Los Angeles	CA	90028
Chris	Archer	Chino Hills	CA	91709
Colleen	Beardsley	Cobb	CA	95426
Marilyn	Caston	San Francisc	CA	94123
Maree	Penhart	Oxnard	CA	93035
Mary	Mc Manus	Berkeley	CA	94709
Scott	Nelson	Bethel Island	CA	94511
Stephen	Robie	Cupertino	CA	95014
Michele	Beckwith	El Dorado Hill	CA	95762
Robert & Susi	Pratt	Oak Park	CA	91377
Ann-Elise	Zarkower	San Francisc	CA	94112
Armando A.	Garcia	Paramount	CA	90723
James	Bott	Bonita	CA	91902
Sim	Mirande	Castro Valley	CA	94546
David	Smith	Irvine	CA	92617
Val	Nordeman	Laytonville	CA	95454
Jamie	Peters	San Diego	CA	92109
David	Downing	Desert Hot Sp	CA	92240
Pamela	Magathan	Los Angeles	CA	90068
Stefanie	Kaku	Carmel	CA	93922
Dr. Prisca	Gloor	Los Angeles	CA	90066
Sondra	Boes	Campbell	CA	95008
Mack	Errea	Laguna Nigue	CA	92677
Rudolf	Beran	Foster City	CA	94404
Karen	Villanueva	San Francisc	CA	94132
A	Sparks	Castro Valley	CA	94546
Margaret & Jc	Connell	Goleta	CA	93117
Daniel	Gonzalez	San Diego	CA	92129
Andrew	Olsen	Los Angeles	CA	90027
Lauren	Bryant	La Crescenta	CA	91214
Carl	Austin	Garden Valley	CA	95633
Loretta	Hayes	Pleasanton	CA	94588
Urs	Hoelzle	Palo Alto	CA	94306
Paul	Norup	Crescent City	CA	95531
Chrisann	Totsis	Temple City	CA	91780
Kevin	Jensen	Novato	CA	94947
David	Haake	Culver City	CA	90230
Lesley	Culhane	Camarillo	CA	93010
Anne	Van Oppen	Palos Verdes	CA	90274
Barry	Schwartz	Los Angeles	CA	90045
Nancy	Devine	Mountain Vie	CA	94043

Kelly	Hendricks	Temecula	CA	92592
Hendrik	De Smet	Los Angeles	CA	90034
Kalyn	Mccloud	Port Hueneme	CA	93044
Pierre	Del Prato	Sacramento	CA	95831
Jeanne	Crabb	Fremont	CA	94536
William	Boosman	Pacific Grove	CA	93950
Hans	Larsen	San Francisco	CA	94111
Cynthia	King	Fillmore	CA	93015
Lanny	Rudner	Venice	CA	90291
Clover	Seely	Grass Valley	CA	95945
Scott	Lohr	Shingle Sprin	CA	95682
William	Crist	Pacifica	CA	94044
Diane	Mader	Walnut Creek	CA	94595
Jan	Blum	San Francisco	CA	94133
Roberto	Aburto	San Diego	CA	92113
Frank	Letton	Whitethorn	CA	95589
Gena	Simmons	Citrus Heights	CA	95610
Debbie	Hill	Eureka	CA	95501
James	Provenzano	Los Angeles	CA	90049
Marsha	Malone	Chino	CA	91710
Nerin	Gonzalez	San Diego	CA	92102
Ruth	Goldschmidt	San Diego	CA	92130
Ed	Green	Fremont	CA	94539
Patricia	Boroughs	Lake View Ter	CA	91342
Alan & Charles	Drummer	Burlingame	CA	94010
M	Coulter	Sacramento	CA	95814
Elena	Ennouri	Redwood City	CA	94061
Lou Ann	Steinwand	Placentia	CA	92870
Mona Loya	Talamantes	South Pasadena	CA	91030
Neal	Pardee	Los Angeles	CA	90026
Amy	Voge	Oakland	CA	94602
Dennis	Griffin	Carlsbad	CA	92008
Tara	Inden	Los Angeles	CA	90046
Kevin	Toney	Richmond	CA	94803
Bruno	Alicke	Fairfax	CA	94930
Ellen	Wade	San Diego	CA	92107
Ann	Sullivan	Lakeside	CA	92040
Art	VanKampen	Los Angeles	CA	90068
Elizabeth	Clapp	Vallejo	CA	94591
Connor	Strobel	Irvine	CA	92617
Roger	Tucker	Fortuna	CA	95540
Erika	Feresten	Los Angeles	CA	90049
Robert	Hahn	Topanga	CA	90290
Elaine	Gorman	Twain Harte	CA	95383
Mary	Baville	San Dimas	CA	91773
Frank And Ze	Lahorgue	San Rafael	CA	94903
Dianne	Daley	Long Beach	CA	90807
Krish	Venkat	San Francisco	CA	94129
Teresa	Gifford	Mentone	CA	92359
Debra	Pommer-Sieg	Malibu	CA	90265
Melanie	Fisher	Calabasas	CA	91302
Ronald C	Faas	Santa Maria	CA	93455
A	Hern	Los Angeles	CA	90049
Laura	Koeninger	Ukiah	CA	95482
Emily	Nogawski	Los Angeles	CA	90049
Kitty	Merrill	Oxnard	CA	93033
Joseph	Flynn	Sacramento	CA	95815
Cindy	Stein	Thousand Oal	CA	91360
Carol	Holland	Costa Mesa	CA	92627

Jennifer	Holland	Santa Maria	CA	93455
Lynne	Weiske	Los Angeles	CA	90048
Nina	Shilling	Berkeley	CA	94703
Wallace	Rhine	Cazadero	CA	95421
Jim	Stewart	Long Beach	CA	90813
Carlos	Nunez	Reseda	CA	91335
Gail	Farrell	San Mateo	CA	94401
Ken	Stein	Thousand oak	CA	91360
Nancy	Eggleston	San Marcos	CA	92078
Nancy	Eggleston	San Marcos	CA	92078
Theresa	Yandell	Santa Barbar	CA	93105
William	O'Hare	Daly City	CA	94015
Barbara	Dover	Brentwood	CA	94513
Janet	Maker	Los Angeles	CA	90024
Peter	Green	San Mateo	CA	94402
Wayne	Gibb	Forestville	CA	95436
Janelle	Kent	Bishop	CA	93514
Gail	Weininger	Alameda	CA	94501
Sandra	Cope	Irvine	CA	92612
Neal	Lucas	Murrieta	CA	92563
Mary	Mcvey-Gill	Stanford	CA	94305
Harley	Sebastian-Le	Sacramento	CA	95823
Carlos	Bover	Pacifica	CA	94044
Mr/Mrs Jim &	Prola	San Leandro	CA	94577
Karsten	Mueller	Santa Cruz	CA	95060
Barbara	Charis	Valley Village	CA	91607
Marianne	Owens	San Rafael	CA	94901
Jessie	Macleod	Ventura	CA	93001
Lisa	Mcginn	San Clemente	CA	92673
Ron	Rattner	San Francisc	CA	94109
Pam	Griffin	Camarillo	CA	93012
Hershell	Price	Del Mar	CA	92014
Inti	Chan	San Ramon	CA	94583
Valorie	Walker	Fullerton	CA	92832
D.	Rowe	Santa Monica	CA	90403
Sandy	Zelasko	Valley Center	CA	92082
Eve	Prevost	Rohnert Park	CA	94928
Doug	Lenier	Valley Glen	CA	91401
Kevin	Branstetter	Applegate	CA	95703
Laurie	Mclaughlin	San Diego	CA	92116
Sami	Taylor	Lafayette	CA	94549
Barry & Tracy	Kogen	Long Beach	CA	90808
James	Dawson	Davis	CA	95618
M	Olson	Sunnyvale	CA	94086
Heidi	Skolnik	Alameda	CA	94501
Ursula	Simoni	Murphys	CA	95247
Dean	Griswold	Fair Oaks	CA	95628
Richard	Saunders	Oakland	CA	94609
Lorna	Farnum	Rossmoor	CA	90720
Anthony	Padilla	Long Beach	CA	90808
Trecia	Sanders	Fairfield	CA	94534
Lisa	Quattrochi	Aliso Viejo	CA	92656
John	Stickney	Mill Valley	CA	94941
Michael	Essex	El Dorado Hill	CA	95762
Leslie	Branco	Visalia	CA	93277
Paul	Vesper	Berkeley	CA	94703
Alma	Gutierrez	Redondo Bea	CA	90278
Louise	Lefebvre	Huntington B	CA	92647
Deborah	Fischer	Elk Grove	CA	95624

Rick	Sparks	Toluca Lake	CA	91602
Dylan	Nguyen	Milpitas	CA	95035
Brenda M	Colldar	Clovis	CA	93611
Ronald	Zampa	Oakland	CA	94602
Judie and Ric	Keenan	San Diego	CA	92119
Sakura	Vesely	Martinez	CA	94553
Robert	Ortiz	Novato	CA	94945
Ann	Nevans	San Francisc	CA	94133
Ann	Graves	San Leandro	CA	94578
Ruben	Arizmendi	San Diego	CA	92108
Dave	Cowen	San Diego	CA	92127
Hope	Mc Donnell	Oakland	CA	94609
Shirley	Coleman	Pacific Palisac	CA	90272
Sharron	Helmholz	Campbell	CA	95008
Gail	Graff	Lake Sherwo	CA	91361
Robin	Vantassell	San Rafael	CA	94903
David	Yager	Orangevale	CA	95662
Mary	Shallenberger	Paradise	CA	95969
John	Warren	Santa Cruz	CA	95060
Peter	Cole	Oceanside	CA	92056
Sharon	Domon	Crestline	CA	92325
Michael	Mccool	Moraga	CA	94556
Pamela	Llewellyn	Berkeley	CA	94702
Earl	Lippold	Lakewood	CA	90713
Don	Bush	Los Angeles	CA	90066
Pam	Gumpertz	Auburn	CA	95603
Jamie	Pearlstein	San Francisc	CA	94114
Jeffrey	Pekrul	San Francisc	CA	94114
Dorothy	Robinson	Stockton	CA	95219
Robin	Corey	Ventura	CA	93003
Elizabeth	Galarza	Signal Hill	CA	90755
Amara	Siva	San Diego	CA	92128
Kathy	Ruppel	Stanford	CA	94305
J	Hynd	Los Angeles	CA	90027
Donald	Webb	Santa Barbar	CA	93108
Linda And Ric	Averett	Greenbrae	CA	94904
Mitchell	Padgham	San Rafael	CA	94901
Edward	Nattenberg	San Rafael	CA	94901
Edward	Landler	Los Angeles	CA	90065
Kathleen	Kalberer	Modesto	CA	95350
Bonnie	Pearce	Oceanside	CA	92056
Kathleen	Powell	Vallejo	CA	94590
Mary	Ragsdale	Ripon	CA	95366
Randy And Mi	Davis	Vacaville	CA	95688
Russ	Beebe	Sunnyvale	CA	94089
Brandi	Montano	San Francisc	CA	94109
Christopher	Nial	Camarillo	CA	93012
Melvin	Cheitlin	San Francisc	CA	94109
Carlos	Morales	West Hills	CA	91304
David	Sherman	Santa Rosa	CA	95405
Bob	Hoffman	San Diego	CA	92119
Eleanor	Anderson-Mil	Richmond	CA	94804
Zachary	Todd	Brea	CA	92823
Joanne	Sulkoske	Thousand Oal	CA	91360
Anita	Pereira	Richmond	CA	94804
Amanda	Schmidt	Fair Oaks	CA	95628
Amy	Howk	Santa Cruz	CA	95062
David	Levy	Carlsbad	CA	92009
Genevieve	Soares	Oakland	CA	94610

Martha	Fellows	Ojai	CA	93023
Julie	Pearce	Lake Forest	CA	92630
Susan	Balthasar	Los Osos	CA	93402
Russell	Dember	Menlo Park	CA	94025
Carl	Nordholm	Carlsbad	CA	92009
Andreea	Boca	Sherman Oak	CA	91411
Paul	Gullam	Bakersfield	CA	93309
Eugene	Nagle	Escondido	CA	92025
Greg	Rosas	Castro Valley	CA	94546
Susan	Way	San Rafael	CA	94901
Virginia	Kohfeld	Santa Monica	CA	90402
Sheryl	Hamblin	Santa Ana	CA	92704
Ken	Ige	Brentwood	CA	94513
Cynthia	Mcmath	Boonville	CA	95415
Lisa	Cossettini	Playa Del Rey	CA	90293
Randall	Coleman	Santa Rosa	CA	95405
Mha Atma S	Khalsa	Los Angeles	CA	90035
Maureen	Maher	North Hollywo	CA	91602
Priscilla	Peters	Turlock	CA	95380
Kerry	Mccarthy	Chico	CA	95926
Richard	Schwager	Santa Barbar	CA	93105
Michael	Terry	Santa Monica	CA	90402
Darrell	Monaco	McKinleyville	CA	95519
Timothy	Gilmore	San Francisc	CA	94109
Elizabeth	Case	Saratoga	CA	95070
Phyllis	Hagmann	Rialto	CA	92376
Janet	Maker	Los Angeles	CA	90024
Sha	Davies	Redding	CA	96001
John	Zimmermann	Long Beach	CA	90803
Claire	Simonich	Half Moon Bay	CA	94019
Arthur	Aravena	Berkeley	CA	94702
Louise	Zimmer	Paso Robles	CA	93446
Ronald	Le	San Jose	CA	95116
Joseph	Ramirez	Santa Monica	CA	90404
David	Schaechtel	San Luis Obis	CA	93403
Shana	Garcia	San Dimas	CA	91773
Patricia	Brumfield	Oceanside	CA	92056
Kirby	Wohlander	San Diego	CA	92104
Bruce	Wilcox	Oxnard	CA	93033
Lynn	Mayeda	Goleta	CA	93117
Steve	Santos	Ontario	CA	91762
Gabriel	Rosas	Santa Clara	CA	95050
Arline	Mathews	Chatsworth	CA	91311
Sally	Abrams	San Francisc	CA	94110
Doris	Guthrie	Fillmore	CA	93015
Kevin	Patterson	Walnut Creek	CA	94595
Joyce	Heyn	Poway	CA	92064
Anne	Benveniste	Felton	CA	95018
Scott	Boller	Tujunga	CA	91042
James & Almar	Phillips	Palo Alto	CA	94306
Irving Paul	Ackerman	Los Angeles	CA	90027
Evette	Andersen	Grass Valley	CA	95945
Dorothy	Mccarty	Oregon House	CA	95962
Colin	Godwin	Sebastopol	CA	95472
Carol	Huntsman	San Diego	CA	92111
Howard	Beeman	Grass Valley	CA	95949
Donna	Jensen	Playa Vista	CA	90094
Nancy	Mead	Santa Cruz	CA	95060
Arthur L	Glattke	Modesto	CA	95350

Linda	Mellen	Newport Beac	CA	92661
Elizabeth	Deland	Klamath Rive	CA	96050
Gene & Sharc	Waggoner	Pinon Hills	CA	92372
Kathy	Seal	Santa Monica	CA	90405
Barbara	Nystrom	Diablo	CA	94528
Connie	Olivarez	Venice	CA	90291
Todd	Hack	Chula Vista	CA	91913
Lily	Venables	Redlands	CA	92373
Marilyn	Platt	Rialto	CA	92376
Lisa	Rubin	Huntington B	CA	92647
Marijeanne	Sarraille	Pittsburg	CA	94565
Theresa	Winterling	Atherton	CA	94027
Linda	Serrato	Chico	CA	95973
Michelle	Davis	Vacaville	CA	95688
Nancy	Oliver, Esq.	Valencia	CA	91354
Frances	Blythe	Dixon	CA	95620
Elizabeth	Goodwin	Hollywood	CA	90068
Ak	Lum	Sunnyvale	CA	94086
Gregor	Syben	Tahoe City	CA	96145
Susan	Herting	Oakland	CA	94619
William	Richardson	Highland	CA	92346
Carol Ann	Peterson	Ceres	CA	95307
Cleveland	Norton Jr.	San Diego	CA	92111
John	River	Tarzana	CA	91357
Arch	McCulloch	Morongo Valle	CA	92256
Tim	Thomas	Cool	CA	95614
Suzanne	Kent	Santa Cruz	CA	95060
Jean	Zagrodnik	San Diego	CA	92116
Linda	Ostro	Oakland	CA	94611
Claudio	Andrade	Glendale	CA	91208
Shelley	Thomsen	Carlsbad	CA	92011
Casey	Toby	Van Nuys	CA	91411
Thomas	Blom	San Francisc	CA	94131
Harriet	Ingram	San Francisc	CA	94131
Barbara	Wishingrad	Santa Barbar	CA	93103
Marti	Sousanis	San Francisc	CA	94132
Corinne	Linesch	Culver City	CA	90230
Nancy	Berman	Kensington	CA	94707
Tom	Wendel	Sacramento	CA	95811
Edward	Specht	Mill Valley	CA	94941
Sandra	Humphries	Woodside	CA	94062
Anneke	Campbell	Venice	CA	90291
Antonio	Grijalva	LOS ANGELES	CA	90068
Joanne	Devine	Folsom	CA	95630
Steven	Berman	Berkeley	CA	94703
David	Adams	Penn Valley	CA	95946
Brian	Smalley	Oakland	CA	94605
Penny	Sur	Redwood City	CA	94062
Janine	Comrack	Ojai	CA	93023
Daniel	Haber	Santa Cruz	CA	95060
Sallie	Robbins-Druiz	Los Gatos	CA	95033
Dana	Monroe	San Diego	CA	92104
Olivia	Barry	Los Angeles	CA	90066
Patricia	Chamberlain	San Diego	CA	92154
Michael	Hughes	San Diego	CA	92123
Angela	Galgocz-Deak	Monrovia	CA	91016
K.	Lee	San Leandro	CA	94577
Candice	Barnett	Lancaster	CA	93536
Eleanor	Riley	Marina Del R	CA	90292

Cortney	Sumpter	Dos Palos	CA	93620
Vincent	Campisi	Canyon Coun	CA	91387
Maryanne	David	Costa Mesa	CA	92627
Tansy	Woods	San Diego	CA	92116
Leslie	Hickcox	Oceanside	CA	92057
Carl & Beatriz	Hagee	La Jolla	CA	92037
Leslie	Africa	Reseda	CA	91335
Sarah	Friedenberg	San Diego	CA	92130
John	Mason	Santa Clara	CA	95050
Barry	Erbsen	Studio City	CA	91604
Raphael	Metzger	Long Beach	CA	90802
Carol	Becker	Sherman Oak	CA	91423
M	Topping	Los Angeles	CA	90004
Jere	Alhadeff	Garden Grove	CA	92843
Charlotte	Williams	Calistoga	CA	94515
Eric	Ericson	Pacific Plsds	CA	90272
Brenda	Haig	Long Beach	CA	90803
Janet	Graham	Santa Barbar	CA	93111
Diane	Cantwell	Tujunga	CA	91042
David	Sternberg	San Francisc	CA	94118
Cesar	Vargas	Los Angeles	CA	90022
Miles W	McLennan	Santa Barbar	CA	93111
Lily	Sandoval	Pasadena	CA	91101
Colleen	Lobel	San Diego	CA	92126
Marsha	Fowler	Altadena	CA	91001
Claire	Chambers	Murrieta	CA	92563
Colleen	Rodriguez	Reseda	CA	91335
Jane	Nachazel-Ruc	Los Angeles	CA	90026
Maryanne	Glazar	Berkeley	CA	94704
Ralph	Lopez	Los Angeles	CA	90012
Judy	Mazowiecki	Fullerton	CA	92833
Lauren	Schiffman	El Cerrito	CA	94530
Molly	Brown	Mount Shasta	CA	96067
Karil	Daniels	San Francisc	CA	94110
Dana	Wullenwaber	Redding	CA	96001
Heather	Ablog	El Dorado Hill	CA	95762
Gerry	Royse	Sacramento	CA	95821
Tom	Trainum	Windsor	CA	95492
Jeremy	Forsyth	Petaluma	CA	94954
Nicole	Rollings	Highland	CA	92346
Catherine	Hirsch	Redway	CA	95560
Stephanie	Mitchell	Los Angeles	CA	90064
Leigh	Clark	Granada Hills	CA	91344
Douglas	Baker	Vallejo	CA	94590
Paul	Hunrichs	Santee	CA	92071
Thatcher And	Koch	San Jose	CA	95133
Susanne	Madden	Playa Del Rey	CA	90293
Cy	Airo	Orangevale	CA	95662
Karen	Smith	Berkeley	CA	94705
Thomas & Gir	Osborne	Laguna Beach	CA	92651
Jeremy	Spencer	Pacifica	CA	94044
Kenneth	Giannotti	Livermore	CA	94550
Marcus	Nappo	Long Beach	CA	90815
Gina	Colangelo	San Mateo	CA	94403
Jonathan	Dirrenberger	San Francisc	CA	94114
Lisa	Haage	Oakland	CA	94618
Seana	Johnson	Fallbrook	CA	92028
Scott	Scherrman	Penngrove	CA	94951
Charlotte	Oneal	Barstow	CA	92311

Arne	Emerson	Santa Monica	CA	90403
Veronica	Romero	San Jose	CA	95124
Jeff	Holgate	Studio City	CA	91602
Jim	Yarbrough	South Pasade	CA	91030
Marianne	Noller	Nipomo	CA	93444
James	Ryder	Oakland	CA	94618
Maria	Mana	San Francisc	CA	94133
Patrick	Schmitz	Berkeley	CA	94705
Tiffany	Ruiz-Murillo	Burbank	CA	91504
Bruce	Hector	Santa Clarita	CA	91387
Susan	Goldberg	Glendale	CA	91202
Ron	Hansel	West Covina	CA	91790
Robert	DiGiovanni	Monterey	CA	93940
Bernard	Weiner	San Francisc	CA	94110
Michael	Edridge	Novato	CA	94949
Susan	Sally	Chatsworth	CA	91311
Linda	Klein	El Segundo	CA	90245
Nancy	Richards	Santa Rosa	CA	95404
Renee	Klein	Marina Del Re	CA	90292
Robert	Johnson	El Segundo	CA	90245
Thomas J	Carlton	Culver City	CA	90232
Joel	Streicker	San Francisc	CA	94114
Thomas	Morse	Santa Barbar	CA	93105
Phil	Oberman	West Hills	CA	91307
David	Puett	Fair Oaks	CA	95628
Richard	Kolbert	Oakland	CA	94602
Erick	Bonilla	Santa Ana	CA	92706
Maury	Swoveland	Mission Viejo	CA	92691
Dennis	Marchuk	Encinitas	CA	92024
Chris	Lund	Santa Monica	CA	90405
Pat	Magrath	Pomona	CA	91767
Sara	Schoorl	Sacramento	CA	95831
John	Van Straalen	Petaluma	CA	94952
Jeff	Mccombs	San Clemente	CA	92672
Emmylou	Gutierrez	Fresno	CA	93710
W	Lynch	Los Angeles	CA	90049
Patricia	Modlin	Folsom	CA	95630
Masako	Okamoto	Cerritos	CA	90703
Mike	Wertheim	Berkeley	CA	94703
Mark	Brunst	Pacifica	CA	94044
John	Thompson	Santa Barbar	CA	93111
Danielle	Epifani	Berkeley	CA	94708
Anne	Parzick	Corona Del M	CA	92625
Pat	Colburn	Alameda	CA	94501
Marilynn	Russell	Santa Rosa	CA	95407
Kimberly	Scibetta	Shadow Hills	CA	91040
Simone	Schad-Sieber	Encinitas	CA	92024
Gary	Button	Sacramento	CA	95818
John	Pederson	Novato	CA	94947
Ken	Post	Newport Coas	CA	92657
Ken	Post	Newport Coas	CA	92657
Joanie	Ciardelli	San Rafael	CA	94901
Joe	Cuviello	Solana Beach	CA	92075
Don	Wood	La Mesa	CA	91941
Judith	Kirk	Redwood City	CA	94062
Paula	Orloff	Nevada City	CA	95959
Mani	White	Oakland	CA	94602
Rene	Flohr	Burbank	CA	91507
Don	Kreuter	Fullerton	CA	92834

Elizabeth	Blase	Sacramento	CA	95864
Jill	Stassinis	Carpinteria	CA	93013
Helen	Borland	Thousand Oal	CA	91362
Brian	Ulm	Monrovia	CA	91016
Rob	Veis	Pacific Palisac	CA	90272
Michael	Wisper	South San Fr	CA	94080
Lynne	Eggers	San Francisc	CA	94110
Vasu	Murti	Oakland	CA	94611
Diana	Hov	Van Nuys	CA	91401
John	Gosselin	San Francisc	CA	94122
Martha	Land	Concord	CA	94518
Jennifer	Lawson	Corte Madera	CA	94925
Rhonda	Chen	Victorville	CA	92392
Rungruedee	Nualchawee	San Francisc	CA	94134
Karen	Donaldson	Grass Valley	CA	95945
Marvin	Lewis	San Andreas	CA	95249
Robert L	Friedenberg	San Diego	CA	92130
Greg	Taylor	San Francisc	CA	94107
Veronica	Rosing	San Diego	CA	92108
Alexey	Korzuchin	Dublin	CA	94568
Gene	Trautmann	Sherman Oak	CA	91411
Bill	Gardner	Forest Ranch	CA	95942
James	Olson-Lee	Sacramento	CA	95822
James	Hall	Oakland	CA	94609
Margaret	Cosgrove-Kla	Arroyo Grand	CA	93420
Shelley	Plumb	San Diego	CA	92122
John	Miller	San Pedro	CA	90731
Betty	Sorrentino	San Luis Obis	CA	93405
Toochis	Morin	Los Angeles	CA	90036
Jeff	Wells	San Diego	CA	92115
Garrett	Weinstein	West Hills	CA	91307
Maureen	Griffin	Los Altos	CA	94022
Courtney	Ridings	San Diego	CA	92130
Jan	Buckwald	Oakland	CA	94611
Anne	Hodgkinson	El Cerrito	CA	94530
Vince	Harper	Orange	CA	92865
Ilene	Malt	San Anselmo	CA	94960
Shannon	Littrell	Carlsbad	CA	92008
Marlene	Selsman	Los Angeles	CA	90064
Dennis	Allen	Santa Barbar	CA	93103
Jon	Grutman	Los Angeles	CA	90036
Robert	Husbands	San Diego	CA	92117
Joseph	Reel	Pacific Grove	CA	93950
Janice	Kursky	San Francisc	CA	94111
Stacey	Mcrae	Winchester	CA	92596
Randall	Pieper	Lake Elsinore	CA	92530
Margaret	Hunter	Downey	CA	90240
Zvika	Greensfield	San Rafael	CA	94903
Jade	English	Sacramento	CA	95831
Imogene	Blatz	Saratoga	CA	95070
William	Baker	Los Angeles	CA	90042
Nick	Podue	Long Beach	CA	90815
Mark	Chotiner	Thousand Oal	CA	91361
Aia	White-Podue	Long Beach	CA	90815
Regalado	Geoff	Burbank	CA	91503
Scarlet	Rivera	North Hollyw	CA	91602
Sarosh	Patel	Sunnyvale	CA	94087
Brian	Cassidy	Capitola	CA	95010
Tung	Vu	San Jose	CA	95117

Jerry	Giovacchini	Soquel	CA	95073
Blanca	Jimenez	Los Angeles	CA	90001
Keren	Abra	San Francisc	CA	94112
Herbert	Myers	Menlo Park	CA	94025
Glenn	Mullins	Buena Park	CA	90620
Simone	Boudriot	Tujunga	CA	91042
Beverly	Webman	Santa Monica	CA	90405
Diane	Watters	Simi Valley	CA	93065
Michael	Garitty	Nevada City	CA	95959
Christina	Baird	Vacaville	CA	95687
Amy	Spencer	Grass Valley	CA	95949
Susan	Fisher	Lake Elsinore	CA	92532
Petr	Krysl	San Diego	CA	92122
Andrea	Bonnett	Altadena	CA	91001
David	Cronin	Orinda	CA	94563
Michael	MacLafferty	Oakland	CA	94612
James	Dodd	Guerneville	CA	95446
J. Barry	Gurdin	San Francisc	CA	94122
Thi	Ton-Olshaski	Arroyo Grand	CA	93420
Henry	Weinberg	Santa Barbar	CA	93110
Diane	Wesson	Lemon Grove	CA	91945
Jennifer	Heggie	San Francisc	CA	94112
Steven	Cook	Big Bear Lake	CA	92315
Karen	Jacques	Sacramento	CA	95811
Alan	Oakley	Oakland	CA	94601
Kim	Gobel	Clovis	CA	93619
Cheri	Pann	Venice	CA	90291
Irene	Nakamura	Arleta	CA	91331
Lynda	Leigh	Santa Cruz	CA	95062
Traci	Thompson	San Anselmo	CA	94979
Eric	Stiff	Santa Barbar	CA	93105
Eileen	Lorenzini	Mission Viejo	CA	92692
Wendy	Griffin	Long Beach	CA	90804
Anita	Simons	La Jolla	CA	92037
Daryl	Gale	Los Angeles	CA	90024
K	Hooper	Berkeley	CA	94707
Tim	Hayes	San Diego	CA	92115
Merilie	Robertson	Canoga Park	CA	91307
Dency	Nelson	Hermosa Bea	CA	90254
Monica	Soto	San Bernardi	CA	92407
James	Kleinrath	San Carlos	CA	94070
Pablo	Herrero	Laguna Nigue	CA	92677
Sarah	Harvey	Oakland	CA	94606
Shari	Wildschutte	Concord	CA	94521
Jessica	Dardarian	Los Angeles	CA	90046
Kim	Tran	Santa Ana	CA	92707
Deanna	Buhr	Poway	CA	92064
Deborah	Rose	Palo Alto	CA	94303
Annette	Hovorka	Foster City	CA	94404
Jennifer	Grasso	San Pedro	CA	90731
Marco	Aguilera	Carlsbad	CA	92008
Vincent	Shulda	Laguna Nigue	CA	92677
Debbie	Rajcic	Riverside	CA	92503
Richard	Watson	Long Beach	CA	90807
Jeff	Zittrain	Berkeley	CA	94702
Jonathan	Tachibana	Los Angeles	CA	90025
Christine	Fink	Stockton	CA	95207
Roberta	Schear	Oakland	CA	94618
Andrea	Kaufman	Guerneville	CA	95446

Silvana	Mangold	Covina	CA	91722
Ana	Simms	La Mirada	CA	90638
Andre	Pessis	Corte Madera	CA	94925
George	Ruiz	San Carlos	CA	94070
Hye	Tibby	Oceanside	CA	92057
David	Harris	Ventura	CA	93003
Suzette	Ariza	West Point	CA	95255
Josh	Bodine	Fremont	CA	94536
Hollace	Jones	San Diego	CA	92103
Karen	Dega	San Francisc	CA	94118
George	Hrouda	Moreno Valley	CA	92553
Norma	Zapata	Stockton	CA	95207
Kimberly	Palfi	Torrance	CA	90503
Elsa	Ramos	Richmond	CA	94804
Blair	Moser	San Francisc	CA	94110
Amy	DeSantis	Los Angeles	CA	90025
Tommy	Killingsworth	San Diego	CA	92117
Tiffany	Le	Los Angeles	CA	90005
Ray	Spencer	Los Angeles	CA	90064
Stephen	Brown	Berkeley	CA	94704
Leanne	Bynum	Santa Rosa	CA	95401
Leanne	Bynum	Santa Rosa	CA	95401
Camilina	Montanez	Mountain View	CA	94043
Don	Saito	San Jose	CA	95132
Mike	Kappus	San Francisc	CA	94116
Celeste	Hong	Los Angeles	CA	90027
Tim	Bartell	North Hollyw	CA	91602
Jeffrey	Beckers	Oakland	CA	94602
Charles	Utt	Dixon	CA	95620
Julie	Donoho	La Verne	CA	91750
Jan	Snedegar	Laguna Beach	CA	92651
Dennis & San	Davie	Capitola	CA	95010
Paul	Schmidt	Irvine	CA	92603
Patricia	Iwata	Sonora	CA	95370
Rodger	Reed	Long Beach	CA	90803
Michael A.	Dirlam	Los Angeles	CA	90039
Laurel	Powers	Petaluma	CA	94952
Darrell	Neft	Costa Mesa	CA	92626
Mercy	Sidbury	Sebastopol	CA	95472
Bill	Rose	Huntington B	CA	92646
Michael	Kavanaugh	San Francisc	CA	94115
Lynda	Obershaw	Pasadena	CA	91101
Herbert C.	Ziegler	Yucaipa	CA	92399
John	Spinale	San Francisc	CA	94114
Jane	Holt	Los Altos	CA	94024
Martin	Sym-Smith	Winnetka	CA	91306
Nancy	Herzog	Pismo Beach	CA	93449
Stuart	Greenburg	Stevenson Ra	CA	91381
Dudley and C	Campbell	Valley Glen	CA	91401
John	Rosenfeld	Los Angeles	CA	90049
Tom	Lapinski	Greenbrae	CA	94904
Jason	Ellis	Sacramento	CA	95819
Dennis	Allen	Santa Barbar	CA	93101
Pamela	Lau	San Jose	CA	95126
M.	Canter	Tiburon	CA	94920
Claudia	Saporiti	Hawthorne	CA	90250
Marc	Pilisuk	Berkeley	CA	94708
Karissa	Huang	Sunnyvale	CA	94086
Patrick	O'Rourke	Aptos	CA	95003

Kat	Burgess	Santa Monica	CA	90404
Terance	Tashiro	Los Angeles	CA	90045
Michael	Lipinski	San Mateo	CA	94401
Pete	Cox	Mission Hills	CA	91345
Ann	Stratten	La Mesa	CA	91941
Lowell	Gomes	Rancho Cucar	CA	91730
Donald	Stuart	Cloverdale	CA	95425
Bruce	Cozzini	Aptos	CA	95001
Herbert C.	Ziegler	Yucaipa	CA	92399
Brittany	Bechtel	Morro Bay	CA	93442
Dan	Wizner	Sacramento	CA	95826
Allison	Jones	Oakland	CA	94612
Gayle	Allard	Twain Harte	CA	95383
Martin	Baclija	Indio	CA	92203
Joseph & Chri	Hardin	Santa Monica	CA	90405
Ilona	Zamora	Cotati	CA	94931
David	Colden	Beverly Hills	CA	90212
Lee	Robinson	El Dorado Hill	CA	95762
Sheila	Shane	Huntington B	CA	92649
Ken	Lawson	Cohasset	CA	95973
Pat	Bryan	Lemon Grove	CA	91945
James	Johnson	Simi Valley	CA	93065
Andy	Tomsky	San Marcos	CA	92079
Sandie	Minasian	Porter Ranch	CA	91326
Violeta	Enciso	Duarte	CA	91010
Carol	Goldstein	San Diego	CA	92122
Walter	Ramsey	Oakley	CA	94561
John	Goldsmith	Ukiah	CA	95482
Alice	Polesky	San Francisc	CA	94107
Stephanie	Imah	Hercules	CA	94547
Jessica	Theissen	Berkeley	CA	94702
Ms.	Courtney	Orange	CA	92867
Victoria	Miller	Encino	CA	91436
John	Lynch	Eureka	CA	95501
Michael	Sullivan	San Diego	CA	92124
Judith	Radovsky	South Pasade	CA	91030
Terry	Crownover	Folsom	CA	95630
Steve	Hylton	Lake Isabella	CA	93240
Brian	Murphy	Sherman Oak	CA	91423
Howard	Dillon	Bolinas	CA	94924
Sharlene	Osorio	Angwin	CA	94508
Pat	Blackwell-Mar	Castro Valley	CA	94552
Michael	Reith	Woodland Hill	CA	91367
Inger	Acking	Berkeley	CA	94710
Jeanne	Nourse	Vineburg	CA	95487
Isabel	Leonard	Walnut Creek	CA	94595
Thomas	Hervey	Santa Barbar	CA	93106
Dan	Richman	San Francisc	CA	94114
Gina	Ness	Petaluma	CA	94954
Jacqueline	Meyer	Foster City	CA	94404
Elke	Savala	El Cerrito	CA	94530
Mason	Kocel	Oceanside	CA	92057
Sunny	Powell	Rohnert Park	CA	94928
Gail	Cheeseman	Saratoga	CA	95070
Nikko	Raffin	Pinon Hills	CA	92372
Sheri	Hill	Santa Maria	CA	93458
Sheri	Hill	Santa Maria	CA	93458
Ashton	Galloway	San Jose	CA	95123
John	De La Torre	Long Beach	CA	90807

Joel	Okada	El Segundo	CA	90245
Anthony	Shogren	Los Angeles	CA	90031
Lynn	Garnica	Berkeley	CA	94703
Ted	Rees	Mountain View	CA	94040
Arlene	Pantalone	Redding	CA	96003
Mehry	Sepanlou	Playa Del Rey	CA	90296
Dennis	Young	Pismo Beach	CA	93449
Linda	Sturges	Glendale	CA	91202
Barbara	Martin	San Carlos	CA	94070
William	Werle	San Francisco	CA	94122
Lyn	Younger	San Jose	CA	95111
Nicholas	Rulli	Los Angeles	CA	90026
Shea	Harvey	Napa	CA	94558
Marion	Barry	Loomis	CA	95650
Roger	Vortman	Santa Cruz	CA	95060
Marianna & F	Mejia	Soquel	CA	95073
Judith	Sullivan	Benicia	CA	94510
Dennis	Villavicencio	Three Rivers	CA	93271
Michael	Pou	San Dimas	CA	91773
Lori	Patton	Aliso Viejo	CA	92656
Stephen	Markel	Los Angeles	CA	90066
Deborah	Miller	Santa Barbara	CA	93108
Rudolph	Morgenfruh	Anaheim	CA	92808
Julie	Ciancio	Redlands	CA	92373
Carol	Gold	Fairfax	CA	94930
Mary	Gamson	Oakland	CA	94610
Joe	Hughes	Clearlake	CA	95422
Daniel	Nakashima	Long Beach	CA	90806
Dave	Thibodeau	Corte Madera	CA	94925
Rod	Fisher	Laguna Beach	CA	92651
Vanessa	Ipsen	San Carlos	CA	94070
Elva	Pero	Dana Point	CA	92629
Albert	Levy	Emeryville	CA	94608
Victoria	Wyatt	Crestline	CA	92325
Kathleen	Delander	South San Francisco	CA	94080
Charmaine	Bailey	San Francisco	CA	94118
Steve	Gompertz	Arcata	CA	95518
Susan	Hathaway	Pico Rivera	CA	90660
Michele	Smolen	Studio City	CA	91604
Shirley	York-Bassel	Oakland	CA	94606
Sacha	Badame	Oakland	CA	94610
Pam	Slater-Price	Del Mar	CA	92014
John	Fang	Piedmont	CA	94611
Caroline	Robinson	Mill Valley	CA	94941
Amanda	Demarino	Valencia	CA	91354
Judith	Walter	Palmdale	CA	93550
Pamela	Letourneau	Santa Rosa	CA	95403
Caroline	Good	Sherman Oaks	CA	91423
Mary Ann	Harrel	Berkeley	CA	94710
Nicole	Savage	San Francisco	CA	94121
Kay	Rudin	Westport	CA	95488
Brian	Carr	San Jose	CA	95124
Nikki	Larkins	Stanton	CA	90680
Nikki	Larkins	Stanton	CA	90680
Rory	Alden	Berkeley	CA	94704
Kimberly	Hughes	Mill Valley	CA	94941
Suzanne	Zahrobsky	Greenwood	CA	95635
Ross	Woodbury	Nevada City	CA	95959
Michael	Blodgett	Oakland	CA	94601

Dan	Goldberg	Santa Cruz	CA	95060
Robin Sager	Whitney	Berkeley	CA	94710
Elaine	Forester	Goleta	CA	93117
Anne	Reldt	Newark	CA	94560
Veronica	Jacobi	Santa Rosa	CA	95401
Lynn	Ryan	Torrance	CA	90505
Judith	Scarborough	El Sobrante	CA	94803
Ian	Reddoch	Tracy	CA	95377
Bev	Kelly, Ph.D.	Long Beach	CA	90803
Mary	Roth	Richmond	CA	94801
D.	Rincon	Fresno	CA	93703
Nina	Rosenfield	Pacific Palisac	CA	90272
Andy	Scott	Paso Robles	CA	93446
Louise	Johnson	Modesto	CA	95350
Melinda	Grant	Cupertino	CA	95014
Richard	Flittie	Walnut Creek	CA	94597
Nancy	Naylor	Lone Pine	CA	93545
Rebecca	Koo	San Diego	CA	92108
Jim	Hartung	Santa Monica	CA	90402
Ingrid	Ramsay	San Anselmo	CA	94979
Jason	Park	Arcadia	CA	91006
Janice	Atwell	Burbank	CA	91506
Robert	Jasper	Loomis	CA	95650
Hana	Yi	Rancho Cucar	CA	91730
Cassandra	Lista	Santa Rosa	CA	95407
Christine	Zemba	Culver City	CA	90232
Linda	Husa	Hesperia	CA	92345
Jason	Ross	Huntington B	CA	92649
Nancy	Carey	Vallejo	CA	94590
Greg	Goodman	Concord	CA	94519
Jesse	Simons	Davis	CA	95616
Danny	Yee	Pleasanton	CA	94566
Gretchen	Cooper	San Diego	CA	92128
Marcy	Chapin	San Luis Obis	CA	93401
Natalie	Pedroza	Camarillo	CA	93010
Diana	Lubin	La Mesa	CA	91941
Teresa	Sullivan	Los Angeles	CA	90065
Carol	Fusco	Berkeley	CA	94708
Kenneth	Jetton	Petaluma	CA	94952
Linda	Halpern	Berkeley	CA	94709
Ann	Alexander	Santa Rosa	CA	95409
Nancy	Walter	San Luis Obis	CA	93406
Mildred	Chazin	Albany	CA	94706
Sarah	Alvarez	Torrance	CA	90505
Alan	Haggard	San Diego	CA	92105
Tami	Grove	Santa Cruz	CA	95060
Tom	Sanchez	Los Angeles	CA	90031
Guillermo	Gonzalez	San Jose	CA	95118
Michael C	Collins	Santa Cruz	CA	95062
Linda	Cowgill	Santa Monica	CA	90405
Vicki	Tomola	Point Arena	CA	95468
Marco	Vasquez	Santa Clara	CA	95050
Gail	Mcgowan	San Francisc	CA	94109
Tamara	Voyles	Sebastopol	CA	95472
Sally	Tompkins	San Bruno	CA	94066
Lianne	Venner	Antioch	CA	94531
David	Diep	San Jose	CA	95136
Kenneth & Ar	Chraft	Simi Valley	CA	93063
John	Steponaitis	San Francisc	CA	94109

Erna	Elias	San Francisc	CA	94121
Virginia	Robbins	Altadena	CA	91001
Patricia	Keefe	Novato	CA	94945
Adam	Kaplan	Laguna Beach	CA	92651
Paula	Summers	Fair Oaks	CA	95628
Martin	Tripp	Santa Clarita	CA	91390
Beatrice	Nelson	Hayward	CA	94541
Joan	Weaver	Chatsworth	CA	91311
Cassie	Murphy	Templeton	CA	93465
Richard	Walker	Berkeley	CA	94702
Lucille	Robustelli	San Juan Cap	CA	92675
Jo Anne	Bailey	Menlo Park	CA	94025
Simone	Mills	Pasadena	CA	91104
Michael	Tomczyszyn	San Francisc	CA	94132
Leonard	Chandler	San Jose	CA	95116
Suzanne	Salerno	Temple City	CA	91780
Lesley	Giger	Perris	CA	92570
Mary	Salerno	Temple City	CA	91780
Eva	Engsler	Berkeley	CA	94702
Eric	Hiss	Los Angeles	CA	90027
Charles	Roth	Pasadena	CA	91106
Rick	Herbert	Berkeley	CA	94705
Pamela	Larue	Long Beach	CA	90808
Anthony	Stratton	Elk Grove	CA	95624
Helen	Webb	Redlands	CA	92373
Anita	Watkins	Oakland	CA	94611
Linda	Hewitt	San Diego	CA	92108
Jan	Austin	Temecula	CA	92591
Ralph	Roug	Lake Forest	CA	92630
Barbara	Mrozek	San Francisc	CA	94109
Elizabeth	Milliken	Saint Helena	CA	94574
Taran	Wanderer	San Jose	CA	95112
Maya	Juarez	Sacramento	CA	95816
Belle-Marie	Montes De Oc	Los Angeles	CA	90044
Lois	Robin	Santa Cruz	CA	95062
Matthew	Peak	Los Angeles	CA	90017
Sam	Butler	Los Angeles	CA	90045
Dale	Mckenna	Lompoc	CA	93436
Roger	Blair	Fremont	CA	94555
Karen	Eikeland	Alameda	CA	94501
Althea	Kippes	San Francisc	CA	94109
Steve	Wendt	Chico	CA	95928
Foster	Boone	Etna	CA	96027
Peter	Yee	Mountain View	CA	94043
Janice	Weiland	Westlake Vill	CA	91359
Dan	Mcgrane	Pleasanton	CA	94566
Probyn	Gregory	Tujunga	CA	91042
Charle	Hazlehurst	Redding	CA	96003
Marilyn	Jasper	Loomis	CA	95650
Nicole	Fountain	Fremont	CA	94536
Ryan	Davis	Burbank	CA	91502
Ema	Concone	Santa Monica	CA	90401
Heidi	Morrell	Los Angeles	CA	90004
Thomas	Alexander	Quincy	CA	95971
Stephen	Greenberg	Nevada City	CA	95959
Marybeth	Bangert	Santa Ana	CA	92705
Mark	Kunzman	Santa Cruz	CA	95063
Marie	Perry	Ceres	CA	95307
amrit	khalsa	redondo beac	CA	90278

Susan	Kaar	Pleasant Hill	CA	94523
Alexandra	Skwara	San Diego	CA	92115
Teresa	Vincent	Merced	CA	95348
Esperanza	Martinez	San Francisc	CA	94134
Laurel	Brewer	West Hollywo	CA	90069
Anne	Kobayashi	San Diego	CA	92122
Jason	Olzsanicky	San Marcos	CA	92069
Damian	James	Oakland	CA	94609
Adrian	Haemmig	Auburn	CA	95602
June	Ko-Dial	Oakland	CA	94602
Tess	Husbands	San Diego	CA	92117
Stephen	Richards	Bakersfield	CA	93308
Ashlee	Johnson	Simi Valley	CA	93063
Darlene	Lovell	Bakersfield	CA	93301
Joan	Pool	Vacaville	CA	95687
Jan	Nolte	Palo Alto	CA	94306
James	Ussery	Lodi	CA	95240
George	Schneider	San Diego	CA	92105
Jacqueline	Lefler	Sebastopol	CA	95472
Claudia	Leung	San Francisc	CA	94110
Maree	Mcguire	Castro Valley	CA	94552
Alicia	Snow	San Francisc	CA	94114
Christopher	Michno	Claremont	CA	91711
Robin	Wiseman	Los Angeles	CA	90039
Jason	Bowman	Placerville	CA	95667
Joseph	Udovch	Laguna Hills	CA	92653
Amanda	Heske	Fullerton	CA	92833
Toby	Schultz	Santa Barbar	CA	93108
Savannah	Gil	Desert Hot Sp	CA	92240
Daniel	Bauer	San Dimas	CA	91773
C	C	Los Angeles	CA	90017
Michael	Gartzman	West Hollywo	CA	90069
Don	Miller	Tiburon	CA	94920
Gita	Dev	Woodside	CA	94062
James	Doolittle	Thousand Oal	CA	91360
Mary	Sullivan	Huntington B	CA	92647
Subrata	Sircar	Sunnyvale	CA	94087
Miyuki	Powell	Midway City	CA	92655
Felix	Paz	Huntington B	CA	92647
Karen	Loro	Nevada City	CA	95959
Wafic	Khall	Pasadena	CA	91102
Maryann	LaNew	San Clemente	CA	92673
Frank	Verga	Monterey	CA	93940
Michelle	Seers	Garden Grove	CA	92845
Brian	Kuhn	Santa Monica	CA	90405
Reevyn	Aronson	Redwood City	CA	94061
Linda	Davidson	Lakeside	CA	92040
B Diane	Fowler	Colfax	CA	95713
John	De La Torre	Vallejo	CA	94591
Jacqueline	Domnitz	Millbrae	CA	94030
Terrell	Rodefer	Van Nuys	CA	91405
Kathleen	Kuczynski	Lake Forest	CA	92630
Dennis	Daigle	Antioch	CA	94531
Norene	Gift	El Segundo	CA	90245
Helen	Gordon	Woodside	CA	94062
A Noel	Andrews	Los Angeles	CA	90066
Janice	Cleary	Thousand Oal	CA	91360
Naomi	Uyeda	Temple City	CA	91780
Lisa	Butterfield	Eureka	CA	95501

Arin	Keshishian	Glendale	CA	91206
Clive	Chafer	Oakland	CA	94619
Jason	Fish	Modesto	CA	95355
Mario	Rivas	Sherman Oak	CA	91423
Audrey	Mannolini	Huntington B	CA	92646
Lawrence	Menasco Jr	Ventura	CA	93004
Ruth	Sinfuego	Palm Springs	CA	92263
Doug	Danaher	San Jose	CA	95118
Ralph	Smith	Los Angeles	CA	90066
Raven	Davis-King	Orangevale	CA	95662
Ed	L	Santa Monica	CA	90404
Linda	Sherwood	Los Angeles	CA	90066
William	Kennedy	Pasadena	CA	91101
Marilynn	Brown	Fairfield	CA	94534
David	Fura	San Francisc	CA	94133
Rene	Suarez	Buena Park	CA	90620
Juan A.	Zamarripa	Los Angeles	CA	90026
Brandon	Owens	San Francisc	CA	94118
Gayle	Spencer	Menlo Park	CA	94025
Maureen	Noble	Laguna Nigue	CA	92677
Aixa	Fielder	Los Angeles	CA	90016
Ron	Goldman	Los Altos	CA	94024
Billie	Abbott	Marina	CA	93933
Brian	Hitchcock	Torrance	CA	90505
Ingrid	Rowland	Corona Del M	CA	92625
Efren	Rojas	Ontario	CA	91761
Nancy	Brodersen	Glendale	CA	91201
Nina	Minsky	Carpinteria	CA	93013
Scott	Palmer	Santa Rosa	CA	95409
Todd	Templeton	Sunland	CA	91040
Shekinah	Johns	Bellflower	CA	90706
Ian	Marshall	South Pasade	CA	91030
Marialyce	Davala	Richmond	CA	94806
Julie	Alley	Long Beach	CA	90807
Pam	Worrallo	Rancho Santa	CA	92688
Peter	Monroe	Alhambra	CA	91803
Vera	Lawrence	Sherman Oak	CA	91423
Richard	Agee	San Diego	CA	92107
Jon	Schafer	Lawndale	CA	90260
Deisha	Garcia	San Jose	CA	95118
Pietro	Poggi	San Rafael	CA	94901
Savanna	Rudershauser	Chula Vista	CA	91910
Connor	O'Brien	Palo Alto	CA	94304
Jamie	Swanson	Los Angeles	CA	90039
Ian	Marshall	South Pasade	CA	91030
Laura	Brittain	Bakersfield	CA	93309
Wendy	Lo	Sunnyvale	CA	94087
Britton	Pyland	Berkeley	CA	94707
Bob	Edgerly	Cathedral Cit	CA	92234
Nicholas	Hernandez	Hemet	CA	92544
Rob	Sweeney	Burbank	CA	91505
Annette	Clarmitaro	Santa Cruz	CA	95060
ROBERT	PARKER STEL	REDWOOD CI	CA	94063
Rob	Bagley	Perris	CA	92571
Jeffrey	Jones	Sherman Oak	CA	91423
Laurie	Tsitsivas	Dana Point	CA	92629
Harriette	Jensen	Oakland	CA	94619
Bruce	Bixler	Atherton	CA	94027
Elizabeth	Veach	Ukiah	CA	95482

Brett	Holland	Los Angeles	CA	90026
Jerry	Tobe	Los Angeles	CA	90034
Frederick	Johnson	San Francisco	CA	94102
Nicole	Yeager	Redlands	CA	92374
Julie	Sasaoka	Concord	CA	94518
Timothy	Hayes	El Cajon	CA	92020
Kevin	Kraft	Menlo Park	CA	94025
Richard	Puaoli	Novato	CA	94949
Luis	Garcia	Anaheim	CA	92801
Steven	Chasen	Santa Monica	CA	90405
Douglas	Hembry	Los Gatos	CA	95032
Teela	Pulliam	Mountain View	CA	94040
Donald	Wenger	El Cajon	CA	92021
Candy	LeBlanc	Placerville	CA	95667
Danah	Stimpson	Newport Beach	CA	92660
Becky	Geiser	San Diego	CA	92115
Sukey	Barnhart	Berkeley	CA	94705
Heike	Feldmann	San Francisco	CA	94122
Mitch	Laipple	Millbrae	CA	94030
Paul	Erlich	Panorama City	CA	91402
Nancy	Barcellona	Los Angeles	CA	90004
Paul	Breitkreuz	Corona	CA	92882
David	Buesch	Redwood City	CA	94061
Aaron	Grossman	Mountain View	CA	94041
Miranda	Leiva	Sherman Oak	CA	91423
Gary	Yanowsky	Aptos	CA	95003
Mariano	Marquez III	San Francisco	CA	94124
Mara	Stevens	San Luis Obispo	CA	93405
Candee	Bass	Woodland Hill	CA	91367
Nina	Sandhu	Fresno	CA	93711
Albert	Shnaider	Encino	CA	91316
Rita	Davenport	Lake Elsinore	CA	92530
Eugene	Majerowicz	View Park	CA	90008
Adam	Wise	Petaluma	CA	94952
Mariah	Luciano	Pacifica	CA	94044
Paula	Toner	Berkeley	CA	94709
Hildegard	Ramsey	Studio City	CA	91604
Wendy	Oakes	San Francisco	CA	94117
Claudia	Mackey	Stockton	CA	95207
Cici	Campbell	Los Angeles	CA	90025
Lana	Walling	Los Angeles	CA	90062
Vincent	VanDenBosch	West Hills	CA	91304
Samara	Hanson Vellor	Petaluma	CA	94954
Mauri	Medding	Joshua Tree	CA	92252
Bob	Miller	Woodland Hill	CA	91364
Scott	Madia	Rohnert Park	CA	94928
Patricia	Estes	Torrance	CA	90503
Robert	Forsythe	Santa Clara	CA	95050
Anthony	Kiedis	Santa Monica	CA	90405
pinkyjain	pan	Santa Rosa	CA	95403
Carol	Downey	Carmichael	CA	95608
Michael	Kast	Panorama City	CA	91402
Jaidev	Rao	Los Angeles	CA	90045
Meteka	Bullard	Inglewood	CA	90305
Murray	Schwartz	Thousand Oaks	CA	91360
Sharon	Cozzette	Castro Valley	CA	94546
Dale	Peterson	Berkeley	CA	94710
Carey	Million	Whittier	CA	90601
Cathy	Stansell	Frazier Park	CA	93225

Rex	Rysewyk	Temecula	CA	92592
Ronald	Granberg	North Hills	CA	91343
William	Gowern	Azusa	CA	91702
Jana	Lalanne	Mountain View	CA	94040
H Clarke	Gentry	Oakland	CA	94609
Ruth	Abad	Vista	CA	92081
Barbara	Bills	Placerville	CA	95667
Tim	Engler	Huntington B	CA	92646
Lora	Monfils	Monterey	CA	93940
Stephen	Muchowski	Philo	CA	95466
Gretchen	Offord	Shasta Lake	CA	96019
Gaile	Carr	Mount Shasta	CA	96067
David	Morgan	Pomona	CA	91766
Kim	King	Nevada City	CA	95959
Ponni	Subbiah	San Francisc	CA	94158
William	Sweetling	Fresno	CA	93710
Myra	Bassin	Auburn	CA	95604
Helene	Whitson	Berkeley	CA	94709
Hank	Ramirez	San Diego	CA	92116
Hope	Millholland	Portola Valley	CA	94028
Andres	Steinmetz	Eureka	CA	95502
Roland	Leong	Pleasant Hill	CA	94523
Mary	Parks	Lompoc	CA	93436
William	Rowland	Los Angeles	CA	90017
David	Maher	Los Angeles	CA	90068
Blaise	Brockman	Arcadia	CA	91007
Terri	Beilke	Vista	CA	92084
Feliz	Nunez	Bermuda Dur	CA	92203
Feliz	Nunez	Bermuda Dur	CA	92203
Mark J.	Fiore	San Francisc	CA	94122
Harold	Broadstock	Atwater	CA	95301
Norm	Ellis	Laguna Hills	CA	92653
Brian	Story	Los Angeles	CA	90039
Paul	Greenfield	Oakland	CA	94607
Belinda	Poropudas	San Rafael	CA	94901
Jo Anne	Snyder	San Diego	CA	92123
Miles	Jordan	Chico	CA	95926
Patricia	Masuda	Fountain Vall	CA	92708
Sheridan & N	McDowell	Sacramento	CA	95825
Albert	Eurs II	Cypress	CA	90630
Ava	Collopy	West Hollywo	CA	90046
William	Sullivan	Colfax	CA	95713
William	Sullivan	Colfax	CA	95713
Sandra	Garratt	Palm Springs	CA	92262
Steven	Aderhold	Fallbrook	CA	92028
Tanner	Ruegg	Long Beach	CA	90815
Karla	Silva	Santa Monica	CA	90403
Ann	McDonald	San Diego	CA	92119
Flint	Sheffield	Sacramento	CA	95814
Debbie	Hooley	Paradise	CA	95969
Kathy	Liso	Sun City	CA	92586
Jerry And Sus	Faunce	Berry Creek	CA	95916
Carolyn	Shaw	Los Angeles	CA	90046
Theresa	Vernon	Santa Rosa	CA	95404
Rolf	Pedersen	Oakland	CA	94602
Jean	Cheesman	Santa Barbar	CA	93103
Kurt	Harevy	Sunnyvale	CA	94089
Lois	Taylor	Monterey	CA	93940
Blake	Hempel	San Carlos	CA	94070

Patricia	Cachopo	Santa Clara	CA	95050
Jeffrey	Diamond	Sebastopol	CA	95472
Lesley	Schultz	Oakland	CA	94610
Christopher	Grouios	Nipton	CA	92364
Robert	Bernal	El Cerrito	CA	94530
Tedd	Kawakami	Stockton	CA	95204
Joy	Zadaca	Long Beach	CA	90807
Dennis	Ledden	Fiddletown	CA	95629
Rev Gregory	Yaroslow	Redlands	CA	92373
Michele	Sterling	South Lake T	CA	96150
Charley	Miller	Huntington B	CA	92647
Steven	Acosta	Los Angeles	CA	90011
Jenny	Wilder	Apple Valley	CA	92308
Hugh	Lehman	Santa Clarita	CA	91350
Burch	Bryant	Davis	CA	95618
Andrew	Frey	Pasadena	CA	91106
Mark	Giordani	Woodland Hill	CA	91303
Joseph	Shulman	San Diego	CA	92115
Ruby	Mitchell	Cupertino	CA	95014
Janet	Culp	Santa Cruz	CA	95060
Sharon	Kincaid	Fountain Vall	CA	92708
Michael	Bordenave	Fresno	CA	93728
Adella	Albiani	Penn Valley	CA	95946
Eva	Thomas	Woodside	CA	94062
Ed	Odjaghian	San Diego	CA	92128
Noemi	Alvarado	Vista	CA	92083
Patricia	Davis	Oakland	CA	94610
Barbara	Broz	Sherman Oak	CA	91413
B.	Rodriguez	Hercules	CA	94547
Carol	Baier	San Diego	CA	92103
Fidel	Mora	San Francisc	CA	94122
Dirk	Obudzinski	San Francisc	CA	94122
Leigh	Slater	Santa Rosa	CA	95403
Lawrence	Sullivan	Emeryville	CA	94608
Gina	Mirabile	Van Nuys	CA	91411
Roslyn	Jones	Riverside	CA	92506
Terri	Zacanti	Fort Bragg	CA	95437
Signe	Wetteland	Davis	CA	95618
Keiko	M.	San Francisc	CA	94118
Thorsten & G	Ostrander	San Diego	CA	92131
Leroy	Francis Jr	Castro Valley	CA	94552
David	Roos	Los Altos Hills	CA	94022
Holly	Dains	Palm Desert	CA	92260
Martin	Rockstrom	Pleasanton	CA	94566
Felipe	Garcia	Oroville	CA	95965
Jim	Tangney	Fair Oaks	CA	95628
Robert	Duckson	Hemet	CA	92543
Edward	Zadeh	Glendale	CA	91201
K	C	Chula Vista	CA	91911
Edward	Huang	Arcadia	CA	91006
Melissa	Hassonsnell	Davis	CA	95618
Michele	Stewart	San Diego	CA	92128
Marjorie	Schwartz	Santa Rosa	CA	95403
Clare	Colquitt	San Diego	CA	92116
James	Ramsey	Crescent City	CA	95531
Carmen	Lima	Chino	CA	91710
Nellie	Lacy	Big Bear City	CA	92314
Richard	Blincoe	Upland	CA	91786
Philip	Cooper	Davis	CA	95616

Renay	Hersh	Los Angeles	CA	90048
Sigrid	Acosta Ramos	Van Nuys	CA	91405
Currie	Hambright	Carlsbad	CA	92009
Philip	Simon	San Rafael	CA	94912
Mark	Hargraves	Sebastopol	CA	95472
Carol	Mcgowan	Los Angeles	CA	90066
Jason	Small	Winnetka	CA	91306
Ernie	Looney	Santa Clarita	CA	91380
Rachna	Mathur	La Verne	CA	91750
Joan	Smith	San Francisco	CA	94129
Robyn	Rosenwald	Cotati	CA	94931
Salvatore	Natoli	Three Rivers	CA	93271
Nancy	Albee	Cayucos	CA	93430
Anne	Spesick	Auburn	CA	95604
Crystal	Elston	Arroyo Grand	CA	93420
Carol	Cook	San Mateo	CA	94403
Nancy	Porter-Steele	El Cajon	CA	92020
Louise	Bianco	Tarzana	CA	91356
Jeff	Condit	Escondido	CA	92027
Rex	Franklyn	Tiburon	CA	94920
Allan	Droyan	Fort Bragg	CA	95437
Katherine	Wiese	Carmel Valley	CA	93924
Steve	Hunt	Gualala	CA	95445
Karen	Hafer	San Clemente	CA	92672
James	Lobdell	Santa Rosa	CA	95404
Leslie	Sutherland	Redwood Vall	CA	95470
Guy	Zahller	Aptos	CA	95003
Anthony & Ka	Kent	Paso Robles	CA	93447
Anthony & Ka	Kent	Paso Robles	CA	93447
LeeAnn	Lopez	Winnetka	CA	91306
Anthony & Ka	Kent	Paso Robles	CA	93447
Merlyn	Collmeyer	Los Gatos	CA	95030
Barbara	Ginsberg	Santa Cruz	CA	95060
Carolyn	Knoll	Orinda	CA	94563
Ellen	Broms	Sacramento	CA	95831
Tracy	Gilbert	Rialto	CA	92377
Cecile	Geary	Laguna Nigue	CA	92677
Rus	Postel	Westminster	CA	92685
Linda	Williams	San Diego	CA	92128
Corey	Benjamin	Los Angeles	CA	90006
Heather	Fisher	Salinas	CA	93908
Robert	Roos	Spring Valley	CA	91977
Dana	Jones	Eureka	CA	95501
David	Rodriguez	South Pasade	CA	91030
Amanda	Bloom	Oakland	CA	94619
Eric	Carlson, Ph.D	Ventura	CA	93001
James	Lovette-Black	San Francisco	CA	94114
Alan	Duran	Sacramento	CA	95831
Britney	Nucci	Manhattan Be	CA	90266
Rene	Pineda	Hollywood	CA	90068
Beth	Bell	Santa Cruz	CA	95062
Bridget	Mabunga	West Sacram	CA	95691
Sheri	Randolph	Barstow	CA	92311
V.	Johnston	Auburn	CA	95603
Bert	Greenberg	San Jose	CA	95135
Katherine	Leahy	Castro Valley	CA	94552
Avram	Sachs	La Jolla	CA	92037
Beth	Rosselle	Carlsbad	CA	92011
Charles	Heinrichs	Oakland	CA	94619

Severiano	Sanchez	Laguna Beach	CA	92651
Petroula	Staikos	Los Angeles	CA	90049
Mark	Letizia	San Diego	CA	92123
Alecto	Caldwell	Oakland	CA	94619
Kermit	Carraway	Auburn	CA	95602
Will	Noble	San Rafael	CA	94901
Deborah	May	San Francisco	CA	94131
Janet	Aguilera	Daly City	CA	94014
Craig	Jackson	San Diego	CA	92121
Ron	Brown	Santa Clarita	CA	91350
Mary-Lou	Gillette	Fremont	CA	94539
Liz	Clark	Oroville	CA	95966
Catherine	Krueger	El Cerrito	CA	94530
David	Goar	Clovis	CA	93619
Paul	Ramos	Santa Ynez	CA	93460
Carol	Sweeney	San Diego	CA	92119
Linda	Wiley	Willits	CA	95490
John	Gasperoni	John	CA	94703
Rogers	Turrentine	Oceanside	CA	92054
John	Cant	Fremont	CA	94536
Bohdan	Rhodehamel	La Mesa	CA	91941
Steve	Gross	La Mesa	CA	91941
Sandi	Covell	San Francisco	CA	94112
Ursula	Noto	Burbank	CA	91504
Clark	Crandall	Yuba City	CA	95991
Nancy	Fischer	Woodland	CA	95695
Stephen	Rosenblum	Palo Alto	CA	94301
Steven	Larky	Del Mar	CA	92014
Ruth	Consul	Palo Alto	CA	94306
Jan	Oldham	Santa Barbara	CA	93105
Patricia	Krommer	Los Angeles	CA	90007
Alan	Hughes	Woodland Hill	CA	91367
Edward	Cyr	Atascadero	CA	93422
Stephanie	Thompson	Santa Ana	CA	92705
Alfred	Maiz	Pomona	CA	91766
Joseph	Rodriguez	San Jose	CA	95121
Katie	Zukoski	Chico	CA	95928
Sharon	Doyle	Los Angeles	CA	90034
Joyce	Chang	Los Altos	CA	94024
Grant	Power	Los Angeles	CA	90026
Scott	Bravmann	San Francisco	CA	94115
Esta	Kandarian	Los Osos	CA	93402
Aspyn	Burns	San Diego	CA	92119
Karen	Lankford	Murrieta	CA	92563
Brian	Girard	Ventura	CA	93004
Kay	Sundstrom	Los Angeles	CA	90031
Cheryl	Davis	Rio Linda	CA	95673
Jeni	Blumenthal	Los Angeles	CA	90049
Gina	Williams	Sebastopol	CA	95473
Ken	Kuhlken	La Mesa	CA	91941
Marguerite	Felts	San Francisco	CA	94112
Pat	Dufau	San Clemente	CA	92673
Jill	Brock	Walnut Creek	CA	94598
Richard	Falls	San Francisco	CA	94132
Chuck	Hendrickson	Los Angeles	CA	90086
Chuck	Hendrickson	Los Angeles	CA	90086
Jayne	Cerny	Inverness	CA	94937
John	Daly	San Clemente	CA	92672
Linda	Skorheim	Temple City	CA	91780

Bonnie	Thompson	Los Osos	CA	93402
Peter	Gavin	Laguna Hills	CA	92653
Lynne	Pratt	San Diego	CA	92109
Barbara	Purvis	Riverside	CA	92503
R	Wells	Los Angeles	CA	90020
Carolyn	Lee	Fair Oaks	CA	95628
Lin	Heidt	San Diego	CA	92109
Michael	Cate	Carmel	CA	93921
Misha	Askren	Los Angeles	CA	90019
Claude	Lafler	Chino Hills	CA	91709
Karen	Carlson	La Jolla	CA	92037
Carol	Rowland	Creston	CA	93432
Lynne	Contreras	San Bernardino	CA	92404
Terril	Mchardy	Berry Creek	CA	95916
Roberta	Bobba	Alameda	CA	94501
Gina	Luzzi	San Francisco	CA	94127
Donald	Wolf	Santa Rosa	CA	95401
Richard	Heimanson	Sherman Oak	CA	91423
Kristi	Peters	Berkeley	CA	94705
Catherine	Macan	Eureka	CA	95501
Mahwash	Hirmendi	San Jose	CA	95136
Jon	Spitz	Laytonville	CA	95454
G	Wilson	El Dorado	CA	95623
Susan	Boggiano	Oakland	CA	94605
Gerry	Collins	Murrieta	CA	92563
David	Young	Rancho Palos	CA	90275
Rene	Mcintyre	San Francisco	CA	94102
Donna	Thies	Sacramento	CA	95826
Tony	Drew	Santa Monica	CA	90404
Eric	Von Brink	Los Angeles	CA	90012
Ron	Marks	San Jose	CA	95136
Millie	Busse	San Diego	CA	92128
Robert	Rundle	Fresno	CA	93706
Annabelle	Rea	Glendale	CA	91202
Karina	Young	Salinas	CA	93901
Sally	Barron	Laguna Beach	CA	92651
Michael	Cass	Novato	CA	94947
Sylvia	Morris	Morro Bay	CA	93442
Cathren Rose	Murray	Richmond	CA	94801
Kimble	Darlington	Smith River	CA	95567
Linda	Oeth	Corona Del M	CA	92625
Kevin	Kilpatrick	San Diego	CA	92128
Michael	Guerra	Sherman Oak	CA	91423
Ernest	Machen	Berkeley	CA	94705
Margaret	Rogers	Redwood City	CA	94062
Matthew	O'Brien	San Diego	CA	92129
Katharine	Kehr	Sebastopol	CA	95472
Lisa	Dossey	San Francisco	CA	94122
Rina	Segura	Duarte	CA	91010
Ronald	Newby	Del Mar	CA	92014
Kersti	Evans	Sacramento	CA	95822
Kathleen	Salvas	Woodland	CA	95695
Lawrence	Olson	Glendora	CA	91740
Jamie	Chen	Murrieta	CA	92562
Jeanne	Reynolds	Los Angeles	CA	90028
Kai	Martin	Pacifica	CA	94044
Asha	Sidhu	Oceanside	CA	92057
James	Clement	Covina	CA	91724
Marvin	Pettey	San Francisco	CA	94127

Gene	Roza	Clovis	CA	93612
Mayumi	Knox	San Marino	CA	91108
Michele	Coakley	Rancho Cordc	CA	95670
Elizabeth	Bettenhausen	Cambria	CA	93428
Suzanne	Braden	Bakersfield	CA	93311
Mark	Swoiskin	Mill Valley	CA	94941
Elizabeth	Tanguy	Thousand Oal	CA	91360
Rick	Fletcher	Fresno	CA	93711
Laura	Kirton	Belmont	CA	94002
Brandon	Reske	Sacramento	CA	95823
Grace	Goldberger	Palo Alto	CA	94303
Charles	Carroux	Belmont	CA	94002
Joe	Yuhas	San Diego	CA	92116
Reece	Castellano	San Diego	CA	92115
Cindy	Lewis	Templeton	CA	93465
Jo	Greenfield	Beverly Hills	CA	90210
Molly	Mcconnell	San Diego	CA	92116
Leslie	Lethridge	Oakland	CA	94618
Chris	MacKrell	Long Beach	CA	90813
Ana-Paula	Fernandes	Redwood City	CA	94065
Michal	Bouilly	Camarillo	CA	93012
Constance	Franklin	Los Angeles	CA	90026
Michele	Tornabene	Summerland	CA	93067
Chandra	Perkins	Fontana	CA	92335
Herman	Gomes	Rio Vista	CA	94571
Kim	Loureiro	San Diego	CA	92108
Merrilee	Morgan	Carlsbad	CA	92009
Lisa	Martinez	San Francisc	CA	94110
Tina	Dekwaadsten	Topanga	CA	90290
Gordon	Gerbitz	Santa Barbar	CA	93101
Evan	Morgan	Covelo	CA	95428
Sebastian	Villani	Chula Vista	CA	91912
Evangeline	Airth	San Diego	CA	92107
Pam	Pence	Santa Ana	CA	92705
Kim	Fowler	Oakland	CA	94619
Linda	Jaso	Templeton	CA	93465
Brett	Jensen	La Habra Heig	CA	90631
Edith	Wander	Los Angeles	CA	90025
Jean	Templeman	Ben Lomond	CA	95005
Nate	Needham	Fremont	CA	94538
Judith	Davis	Santa Ana	CA	92705
Doris	Mattingly	Huntington B	CA	92646
Jeffrey	Hasenau	Los Angeles	CA	90041
Brent	Hokanson	Fairfield	CA	94533
Marci	Spencer	Castro Valley	CA	94546
Louise	Hawley	Palm Springs	CA	92264
Derek	Bray	Los Altos	CA	94022
Shane	Yellin	Carlsbad	CA	92008
James	Kerr	Redwood Vall	CA	95470
Carolyn	Keck	San Jose	CA	95112
Anne	Harvey	San Diego	CA	92130
Janet	Heinle	Santa Monica	CA	90403
Laura	Godfrey	Corralitos	CA	95076
Neil	Wilson	Alameda	CA	94502
Deirdre	Brownell	Burbank	CA	91504
David	Mcneil	Moreno Valley	CA	92555
John	Petroni	El Cerrito	CA	94530
Elizabeth	Kramer	Santee	CA	92071
Lisabette	Brinkman	Santa Barbar	CA	93101

Jan	Wheadon	Napa	CA	94558
Penny	Meloxhe	Long Beach	CA	90803
Mc	Hagerty	Carlsbad	CA	92013
Sharon	Sullivan	South Lake T	CA	96150
Stacey	Mcdonald	Thousand Oal	CA	91361
James	Masi	San Francisc	CA	94158
Corinne	Van Houten	San Francisc	CA	94104
Beverly	Johnson	Hesperia	CA	92345
Rich	Goldberg	Penngrove	CA	94951
Rose-Mary	Vanslyke	Chatsworth	CA	91311
Mitchell	Olson	Rancho Cord	CA	95670
Will	Tuttle	Healdsburg	CA	95448
Rosie	Manina	San Leandro	CA	94577
Cheri	Michalak	Escondido	CA	92026
Elizabeth	Weiland	Carmichael	CA	95608
June	Green	Belmont	CA	94002
Douglas	Johnson	San Francisc	CA	94124
Chris	Fritsch	Forestville	CA	95436
Kathleen	Bond	San Luis Obis	CA	93401
Caroline	Cunningham	Santa Cruz	CA	95060
Marilyn	Lemmon	Mount Shasta	CA	96067
Kelley	Akin	San Francisc	CA	94131
Gary	Reinoehl	Pioneer	CA	95666
Mark	Gotvald	Pleasant Hill	CA	94523
Thomas	Carrick	Burlingame	CA	94010
R	Rosenberg	Kentfield	CA	94904
Maureen	Burness	Sacramento	CA	95819
Nathan	Hill	Pleasant Hill	CA	94523
Herschel	Surdam	San Mateo	CA	94402
Angie	Richardson	San Francisc	CA	94112
Linda	Springer	Arcadia	CA	91006
Pamela	Hamilton	West Sacram	CA	95605
John	Baum	Hesperia	CA	92345
Linda	Strauss	El Sobrante	CA	94803
Warren	Mcfarland	San Pablo	CA	94806
Courtney	Courtney	Woodside	CA	94062
Brenda	Calloway	Murrieta	CA	92563
Sara	Evans	Monrovia	CA	91016
Dolly	Kaplan	Irvine	CA	92604
Sherman	Lewis	Hayward	CA	94542
Yvette	Irwin	Martinez	CA	94553
Andrea	Murphy	Woodland Hil	CA	91364
Heidi	Smith	San Francisc	CA	94131
Alena	Jorgensen	Temple City	CA	91780
Jennifer	Herstein	Altadena	CA	91001
Jeannie	Pollak	Oxnard	CA	93036
Shirley	Richter	San Marcos	CA	92078
Shirley	Richter	San Marcos	CA	92078
Noah	Youngelson	Los Angeles	CA	90066
Dawne	Adam	Walnut Creek	CA	94597
Andrea	McCullough	Ukiah	CA	95482
Jay & Naoko	Moller	Redway	CA	95560
Cynthia	Crittenton	Newbury Park	CA	91320
Paul	Waller	Woodland Hil	CA	91367
Ronald	Warren	Glendale	CA	91206
Denise & Patr	Mayosky	Milpitas	CA	95035
Ian	Albert	San Francisc	CA	94117
Jeanette	King	Livermore	CA	94550
Michael	Barnett	San Francisc	CA	94112

John	Crahan	Westchester	CA	90045
Brice	Davis	San Francisc	CA	94118
Jinx	Hydeman	Trabuco Cany	CA	92679
Ruth	Aldrich	Magalia	CA	95954
Pat	Yoder	Oceanside	CA	92056
Barbara	Ginsberg	Santa Cruz	CA	95060
Rita	Joyce	Simi Valley	CA	93063
Thomas	Leppold	San Gabriel	CA	91776
Kim	Hanniman	Atwater	CA	95301
Laura	Dutton	Los Angeles	CA	90004
Jeffrey	Tischler	Monterey	CA	93940
Jeff	Arnett	Santa Cruz	CA	95060
Wendy	Beaton	Ventura	CA	93003
Suzanne	Pregun	San Diego	CA	92109
Jackson	Thomas	San Diego	CA	92122
Vic	Bostock	Altadena	CA	91001
Shawn	Zubicek	Yreka	CA	96097
Steven	Greene	Moorpark	CA	93021
Joseph	Buhowsky	San Ramon	CA	94582
Jennifer	Lawton	Murrieta	CA	92562
Carol	Carr	Santa Rosa	CA	95404
Michelle	Cohen	Los Angeles	CA	90043
John	Townsend	Los Angeles	CA	90068
Tim	Wenger	Loomis	CA	95650
Jens	Burkhart	Santee	CA	92071
James	Diviccaro	South San Fr	CA	94083
Claire	Carsman	Palm Springs	CA	92262
Paul	Cheney	Watsonville	CA	95076
Robert	Seltzer	Malibu	CA	90265
Michael	Schumacher	Camarillo	CA	93010
Jeff	Herman	Oceanside	CA	92054
Michael	Mcintyre	Etiwanda	CA	91739
Liana	Olson	Carmel Valley	CA	93924
Rhetta	Alexander	Van Nuys	CA	91405
William	Mittig	Mariposa	CA	95338
John	Mcdonald	Vista	CA	92083
Sue	Mccullough	Oakland	CA	94619
Lorraine	Lowry	Vacaville	CA	95688
Bill	Terstegge	Sebastopol	CA	95472
Kristen	Lowry	Vacaville	CA	95688
Robert	Clay	San Diego	CA	92122
Steph	Fraine	Sebastopol	CA	95472
Gregory	Fite	Castro Valley	CA	94546
Felecia	Mulvany	San Jose	CA	95125
Kathy	Diehl	Albany	CA	94706
Jessica	Colomb	San Diego	CA	92104
Matthew	Culmore	Windsor	CA	95492
Mark	Dempsey	Orangevale	CA	95662
Christina	Irving	Sonora	CA	95370
David	Troupin	San Diego	CA	92109
Douglas	Mccombs	Cazadero	CA	95421
Bob	Skinner	Novato	CA	94947
Johanna	Hart	San Francisc	CA	94116
Bruce	Pollock	North Hollyw	CA	91601
Peter Booth	Lee	San Francisc	CA	94118
Amy	Laird	Livermore	CA	94551
Lisa	Phenix	Carmichael	CA	95608
Judith	Barney	Solana Beach	CA	92075
Martin	Fink	Los Angeles	CA	90024

Richard	Hubacek	Spc. 123	CA	95456
Lorraine	Lowry	Vacaville	CA	95688
Damon	Maguire	McKinleyville	CA	95519
Vonnie	Iams	Poway	CA	92064
Mary	O'Connor	Goleta	CA	93117
Steve	Iverson	Corona Del M	CA	92625
Jerome	Lambert	La Jolla	CA	92037
Gustavo	Perez	Lakewood	CA	90713
Elli	Kimbauer	Crescent City	CA	95531
Breea	Wilson	Petaluma	CA	94952
Linda	Comstock	Yreka	CA	96097
Allison	Navarro	San Juan Bau	CA	95045
Michael	Brackney	San Diego	CA	92103
Roshanee	Lappe	San Pedro	CA	90732
Karen	Yinger	San Juan Bau	CA	95045
David	Wallace	Berkeley	CA	94702
Marlene	Saifer	Venice	CA	90291
Catherine	Tkaczyk	Santa Cruz	CA	95060
Don	Orahood	Bonsall	CA	92003
Nick	Gonzalez	Antioch	CA	94531
Julia	Vetrie	Canyon Coun	CA	91387
Tasia	Surch	Rancho Santa	CA	92688
Lily	Mejia	Ontario	CA	91762
Howard	Whitaker	Gold River	CA	95670
Kim	Bethel	Madera	CA	93638
Christopher	Welch	Sonoma	CA	95476
Curt	Barnett	Long Beach	CA	90803
Jimmie	Lunsford	San Diego	CA	92176
Peter	Meissner	Santa Barbar	CA	93111
Oceana	Collins	Palm Springs	CA	92262
Pacia	Dewald	Daly City	CA	94015
Frances	Michener	San Rafael	CA	94901
Carol	Banever	Los Angeles	CA	90046
Lesley	Mahaffey	Fullerton	CA	92831
Morning Star	Star	Tustin	CA	92780
Kimberly	Nichols	Pacific Palisac	CA	90272
Maureen	Troyer	Benicia	CA	94510
Claire	Perricelli	Eureka	CA	95501
Consuelo	Valenzuela	Paradise	CA	95969
Derrick	Terry	Los Angeles	CA	90047
Chris	Matranga	Rancho Santa	CA	92091
Christopher	Pincetich	Point Reyes S	CA	94956
Gary	Karns	San Diego	CA	92117
Clairann	Venable	Reseda	CA	91335
Catherine	Hudson-Webb	Santa Cruz	CA	95065
Martha	Carrington	Santa Cruz	CA	95062
Greg	Cahill	Culver City	CA	90232
Edward	Bacallao	Carlsbad	CA	92009
Dana	Alvi	Santa Monica	CA	90403
Christel	Capps	San Jose	CA	95123
Peggy	Jamieson	Placentia	CA	92870
Anne	Adams	San Diego	CA	92103
Adam	Wojdac	Antelope	CA	95843
Donna	Lyons	Los Angeles	CA	90036
Nicholas	Sully	El Cajon	CA	92020
Leslie	Sommers	Fallbrook	CA	92028
Ilse	Byrnes	San Juan Cap	CA	92693
Olga	Sevilla	Canoga Park	CA	91303
Jon	Cornelius	San Jose	CA	95126

Joanna	Welch	Eureka	CA	95501
Simone	Butler	San Diego	CA	92110
Gabriela	Sosa	Los Angeles	CA	90027
John	Scott	Butte Valley	CA	95965
Fredrick	Seil	Berkeley	CA	94708
Elizabeth	Potter	Oakland	CA	94605
Karen	Mayes	Santa Maria	CA	93455
Jo	Stevens	Los Angeles	CA	90046
Jennifer	Freitag	Santee	CA	92071
Wally	Wolfe	Valley Center	CA	92082
Eric	March	Santa Ysabel	CA	92070
Iris	Edinger	Woodland Hill	CA	91367
Cynthia	Keefer	Orange	CA	92869
Karen	Quail	Davis	CA	95616
Gary	Dowling	Pope Valley	CA	94567
Shirley	Ramstrom	Redding	CA	96002
Daniel	Hess	Fort Bragg	CA	95437
Peter	Flinders	Cotati	CA	94931
Phillip	Cripps	Cathedral City	CA	92234
Vance	Lausmann	Cathedral City	CA	92234
Pam	Zimmerman	Santa Rosa	CA	95404
Elisabeth	Petterson	Arcata	CA	95521
Eric	Edmondson	Danville	CA	94526
James	Duzanica	Paso Robles	CA	93446
James	Murphey	Fort Bragg	CA	95437
Judith	Wargo	Daly City	CA	94015
Charles	Hancock	Berkeley	CA	94704
Peter	Randolph	Escondido	CA	92029
Sondra	Romey	Santa Ana	CA	92704
Tashi	Norbu	Richmond	CA	94803
Suzanne	Menne	Camarillo	CA	93010
Ralph	Penfield	San Diego	CA	92104
Sharon	Jarvis	Stockton	CA	95204
Helen	Bacon	San Rafael	CA	94901
Alyss	Sanner	Valencia	CA	91355
Penelope	Navone	Cloverdale	CA	95425
Deborah	Kelly	Pasadena	CA	91106
Elizabeth	Anthony	San Jacinto	CA	92581
Ann	Thryft	Boulder Creek	CA	95006
Robert	Dawson	Los Angeles	CA	90065
Gloria	Christal	Los Angeles	CA	90024
Nancy	Voss	Sacramento	CA	95819
Vetza	Trussell	Cherry Valley	CA	92223
Kim	Lazaro	Poway	CA	92064
Annie	Stuart	Petaluma	CA	94952
Pandora	Edmonston	Mariposa	CA	95338
Florence	Leto	Oakland	CA	94610
Phillip	Mertz, RN	Walnut Creek	CA	94595
Laura	Creamer	San Pedro	CA	90731
John	Cobb	Claremont	CA	91711
Dana	May	Garden Grove	CA	92840
Michael	Samuels	San Rafael	CA	94903
James	Dinsmore	Santa Cruz	CA	95062
Charleta	Fuell	Oceanside	CA	92056
Diane	Pearl	South San Fr	CA	94080
Dale	Hendrix	Crescent City	CA	95531
Paul	Voyen	Santa Barbara	CA	93103
James	TRUE	Oakland	CA	94618
Christine	Doyka	Garberville	CA	95542

Katherine	Silvey	Martinez	CA	94553
Bernard	Yosten	San Anselmo	CA	94960
Kristeene	Knopp	Emeryville	CA	94608
Michael	Sarabia	Stockton	CA	95207
Ilene	Mandelbaum	Lee Vining	CA	93541
Chanelle	Black	Huntington B	CA	92648
Sylvia	Edwards	Santa Rosa	CA	95409
James	Roberts	Ventura	CA	93001
RenÈ	Flores	Bonita	CA	91902
RenÈ	Flores	Bonita	CA	91902
Shawn	Emery	Merced	CA	95340
Erlinda	Cortez	Long Beach	CA	90807
Michelle	Eaton	Forest Knolls	CA	94933
Michelle	Eaton	Forest Knolls	CA	94933
Bill	Repetto	Weed	CA	96094
Donald	Fischer	Running Sprin	CA	92382
Ayaka	Emoto	San Francisc	CA	94105
Sarah	L	South Pasade	CA	91030
Kathy	Gebhardt	Duarte	CA	91010
Sarah	Hearon	Santa Barbar	CA	93130
Shelley	Young	Stockton	CA	95215
Richard	Kelly	Oceanside	CA	92056
Ernest	Rosenberg	Mount Shasta	CA	96067
Georgia	Brewer	Sherman Oak	CA	91401
Paula	Hollie	Laguna Wood	CA	92637
Sandra	Peterson	Santa Rosa	CA	95401
Alicia	Dalforno	Vista	CA	92083
Leslie	Spoon	Los Osos	CA	93402
Carey	Tri	Chatsworth	CA	91311
Martha	Fitzpatrick	Dana Point	CA	92629
Sandra	Duggan	Vacaville	CA	95688
Colleen	Carter	Canyon Coun	CA	91387
Martin & Rach	Mazar	Pleasant Hill	CA	94523
Sarah	Sheets	Merced	CA	95341
Scott	Stellar	Atascadero	CA	93422
Gerald	Bukosky	Alameda	CA	94501
Peter	Reardon	Mira Loma	CA	91752
Beverly	Huff	Lake Forest	CA	92630
Galen	Abbott	San Francisc	CA	94107
Linda	Law	Huntington B	CA	92646
Andrea	Carcovich	Torrance	CA	90504
Anthony	Owen	Arcata	CA	95521
Arthur	Peill	Solana Beach	CA	92075
S J	Stratford	Los Angeles	CA	90064
Stefanie	Pruegel	Oakland	CA	94607
Lisa	Mar	Napa	CA	94558
Frederick	Marsh	Huntington B	CA	92647
Lance	Parker	San Diego	CA	92122
Marian	Cruz	Walnut Creek	CA	94596
Jeff	Bagby	Vista	CA	92084
Kathleen	Haberer	Berkeley	CA	94707
Becky	Cecena	Vacaville	CA	95696
Lydia	Chadwick	Stockton	CA	95209
Eileen	Heaser	Sacramento	CA	95819
Jodi	Selene	Grass Valley	CA	95945
Gabriel	Sheets	Merced	CA	95341
Neal And Nan	Steiner	Los Angeles	CA	90034
Brian	Jeffery	Temecula	CA	92592
Thomas	Hawkins	Fort Bragg	CA	95437

Leigh	Stamets	Carmichael	CA	95608
Marsha	Franker	Los Angeles	CA	90066
Sophie	Carter	Foothill Ranch	CA	92610
Simone	Sello	Los Angeles	CA	90035
Jay	Atkinson	El Sobrante	CA	94803
Sandra	Geyer	Fallbrook	CA	92028
Brooke	Prather	Santa Rosa	CA	95404
Elbia	Lembach	Rancho Santa	CA	92688
Colleen	Harrison	Rancho Cord	CA	95670
Laura	Kohn	Woodside	CA	94062
William	Evans	El Cajon	CA	92020
Cyril	Bouteille	Mountain View	CA	94040
Jeffrey	Spencer	Fremont	CA	94536
Susan	Hampton	El Cerrito	CA	94530
Catharine	Holt	Pacifica	CA	94044
Laila	Solaris	Alameda	CA	94501
Anna	Thompson	Carmel	CA	93923
Sandy	Roos	Los Altos Hills	CA	94022
Ramsey	Gregory	Elk Grove	CA	95758
Scott	Clements	Davis	CA	95616
Fjaere	Nilssen-Moon	North Hollyw	CA	91606
sue	kauffman	Laguna Nigue	CA	92677
Benjamin	Hunter	Sacramento	CA	95834
Jeffrey	Coykendall	Los Gatos	CA	95032
Toni	Kimball	Santa Ana	CA	92706
Stephanie	Trudersheim	San Diego	CA	92109
Jay	Rutherford	Sacramento	CA	95826
Greg	Jacobus	Murphys	CA	95247
Alexa	Mcmahan	Huntington B	CA	92649
Kathleen	Smith	San Jose	CA	95112
Gary	Haven	Agoura Hills	CA	91301
Glenna	Powell	Grover Beach	CA	93433
David	Leitch	Venice	CA	90291
Elmer	Berger	San Rafael	CA	94901
Lisa	Kearney	Petaluma	CA	94954
Karla	Everett	San Jose	CA	95136
Angelic	Rubalcava	Pomona	CA	91766
Elizabeth	Levy	Richmond	CA	94805
Jo	Siders	Murphys	CA	95247
Robert	Davenport	Lakewood	CA	90712
Cori	Pansarasa	El Cerrito	CA	94530
Ohmar	Sowle	Moraga	CA	94556
Alan	Dwillis	Lathrop	CA	95330
Fred	Morrison	Hayward	CA	94544
Barbara	Mesney	Los Angeles	CA	90066
Gary	Morris	Napa	CA	94559
Deborah	Sargent	Poway	CA	92064
Clyde	Willson	Oakland	CA	94606
Grace	Hauser	Pasadena	CA	91103
Eduardo	Izquierdo	Santa Cruz	CA	95060
David	Field	Northridge	CA	91324
Harry	Shaw	Petaluma	CA	94952
Terri	Brown	Los Angeles	CA	90095
Katie	Hale	La Canada	CA	91011
Kathy	Taylor	La Mesa	CA	91941
Stacey	Malone	Albany	CA	94706
Cheryl	Draper	Avery	CA	95224
Mary	Steele	Laguna Nigue	CA	92677
Leslie	Lewis	Paradise	CA	95969

Ahlia	Demas Jimen	San Marcos	CA	92078
Carrie	Nichols	Newport Beach	CA	92663
Tamara	Henry	Ben Lomond	CA	95005
Barbara	Sadow	Richmond	CA	94804
Holly	Dowling	Novato	CA	94947
Donna	Morton	Berkeley	CA	94702
Valerie	Justus-Ruscoe	Watsonville	CA	95076
Sean	Singleton	San Francisco	CA	94112
Jay	Hubbell	Fresno	CA	93727
Henriette	Parkman	Los Gatos	CA	95032
Linda	Oster	Escondido	CA	92029
Grant	Gladman	San Leandro	CA	94577
Theresa	Gonzalez	Redwood City	CA	94063
Christine	Fluor	Corona Del Mar	CA	92625
Karen	Lull	Claremont	CA	91711
Ron	Partridge	Simi Valley	CA	93063
Robert	Sorum	Grass Valley	CA	95945
Ellen	Webster	Claremont	CA	91711
Dan	Esposito	Manhattan Beach	CA	90266
Sharon	Rosen Leib	Solana Beach	CA	92075
Jane	Brenner	Santa Rosa	CA	95405
Sam	Maurer	San Francisco	CA	94114
Meghan	Tracy	Long Beach	CA	90808
Claudia	Ciucci	San Rafael	CA	94901
Beverly	Poncia	Lower Lake	CA	95457
Deborah	Hartsough	San Diego	CA	92109
Gary	Sjogren	La Mirada	CA	90638
T	Suzuki	Long Beach	CA	90810
T	Suzuki	Long Beach	CA	90810
Molly	Engellenner	Applegate	CA	95703
Jean	Gladstone	Eureka	CA	95501
Hazel	Cheilek	Mountain View	CA	94043
Katherine	Davis	San Clemente	CA	92672
Robert	Petty	Lompoc	CA	93436
Alan	Liechty	Los Altos	CA	94024
Dan	Anderson	Roseville	CA	95747
Kim	Wise	Novato	CA	94949
Pete	Corkey	San Carlos	CA	94070
Kyle	Bracken	Los Angeles	CA	90066
Marita	Mayer	San Anselmo	CA	94960
Shelley	Reynolds	Napa	CA	94559
Jill	Mistretta	Kentfield	CA	94904
Judy	Jacobson	Benicia	CA	94510
Natasha	Saravanja	San Francisco	CA	94131
Janet And Judy	Garman	Carmel Valley	CA	93924
Terry	Fain	Santa Monica	CA	90405
Amy	Cate	Riverside	CA	92508
Maureen	Besancon	Nevada City	CA	95959
Mathew	Vipond	Sacramento	CA	95818
Joyce	Loewy	Sunnyvale	CA	94089
Frank	Klug	Campbell	CA	95008
T	Banghart	Valley Village	CA	91601
Jisho	Perry	Mount Shasta	CA	96067
Paul	Nelson	Twain Harte	CA	95383
Daniel	Saadia	Laguna Beach	CA	92651
Lloyd	Dearmond	Santa Barbara	CA	93111
Mark	Clark	Carmichael	CA	95608
Donna	Panza	Grass Valley	CA	95949
Maryanne	Murphy Esq.	Los Gatos	CA	95033

Denise	Scott	Ramona	CA	92065
Gillian	Valdes	San Jose	CA	95123
Karen	Dunson	Castro Valley	CA	94546
Karen	Reggio	Castro Valley	CA	94546
Sue	Dunson-Regg	Livermore	CA	94550
Alison	Savior	Los Angeles	CA	90027
Dick	Schroer	Tustin	CA	92780
Ruth	Valderama	Aptos	CA	95001
Patricia	Davis	San Francisc	CA	94115
Robert	Lindey	Rancho Cord	CA	95670
Kevin	Wightman	Sylmar	CA	91392
Ella	Craig	Eureka	CA	95503
John	Matthews	Del Mar	CA	92014
Russell	Bishop	Ventura	CA	93004
Myron	Meisel	Los Angeles	CA	90064
Whit	Clifton	El Sobrante	CA	94803
Rhoda	Slanger	Berkeley	CA	94706
Jude	Todd	Santa Cruz	CA	95062
Katharine	Foley-Salden	Oakland	CA	94618
Shereen	Hawkins	Huntington B	CA	92648
Vicki	Hughes	Huntington B	CA	92649
Timothy	Villalobos	Spring Valley	CA	91977
Diana	Stark	Burlingame	CA	94010
Marge	Schwartz	Santa Barbar	CA	93121
Rob	Rowan	Irvine	CA	92618
Susan	Osova	Redwood City	CA	94063
Dominik	Wolf	San Diego	CA	92127
Judith	Wolf	Vista	CA	92084
Bianca	Molgora	San Francisc	CA	94110
Martha	Ashton-Sikor	Alameda	CA	94501
Mike	Dorer	Fremont	CA	94538
Seychelle	Cannes	Newport Beac	CA	92660
Seychelle	Cannes	Newport Beac	CA	92660
Linda	Antone	Santa Barbar	CA	93105
Mary	Laxague	Belmont	CA	94002
Desiree	Pannier	Vista	CA	92083
Jeff	Levicke	Valley Village	CA	91607
Megan	Rawa	Glendale	CA	91201
Julieta	Pisani McCartl	Berkeley	CA	94702
Marie	Bergen	San Francisc	CA	94118
Marjorie	Salmeron	Eureka	CA	95501
Jane	Silk	Del Mar	CA	92014
Jane	Silk	Del Mar	CA	92014
Bill	Edwards	Tustin	CA	92782
Miguel	Diez	Long Beach	CA	90803
Sherry	Dunn	Penn Valley	CA	95946
Kathy	Yeomans	Ventura	CA	93001
Miriam	Baum	Alta Loma	CA	91701
Paula	Mack	Santa Cruz	CA	95062
Hank	Rivera	Castro Valley	CA	94546
Elizabeth	Eisenbeis	Lodi	CA	95242
Gary	Speck	Hawthorne	CA	90250
Robert	Carpino	Los Angeles	CA	90027
T	Funck	Oakland	CA	94612
Michael	McMahan	Huntington B	CA	92649
Dan	Berger	Petaluma	CA	94952
Carroll	Nast	Colfax	CA	95713
Sara	Smith	San Luis Obis	CA	93401
Judith	Borc	Redwood City	CA	94062

Patricia	Law	San Diego	CA	92102
Carol	Taylor	Ojai	CA	93023
Joy	Vigneaud	Campbell	CA	95008
Joy	Turlo	Redondo Beach	CA	90277
Howard	Nathan	Chico	CA	95926
Alexandra	Davison	Middletown	CA	95461
Patricia	Bowers	Santa Cruz	CA	95062
Teresa	Fisher	Oakland	CA	94611
Carol	Tao	Salinas	CA	93901
Gloria	Resa	Chula Vista	CA	91911
Cameron	Keep	Cathedral City	CA	92234
James	Donald	Markleeville	CA	96120
Nat	Childs	Miranda	CA	95553
Lawrence	Dillard, Jr.	San Francisco	CA	94121
Carole	Cole	Santa Barbara	CA	93103
Jennifer	Gray	San Jose	CA	95119
Kenneth	Dagdigan	Chatsworth	CA	91313
L	D	Albany	CA	94706
Barbara	Lawson	Calimesa	CA	92320
Nancy	Byers	Berkeley	CA	94703
Rachel	Hemmer	Hayward	CA	94544
Judy	Reese	San Bernardino	CA	92407
Rudy	Zeller	Hercules	CA	94547
Sandy	Mishodek	Running Springs	CA	92382
Daniel	Picardi	Salinas	CA	93901
Christopher	Parsons	Los Angeles	CA	90027
Robert	Roberto	Santee	CA	92071
Erin	Schally	Concord	CA	94519
Jay	Price	San Diego	CA	92105
Sudi	Mccollum	Glendale	CA	91206
James	Bottoms	Santa Barbara	CA	93103
Pamela	Morgan	Felton	CA	95018
Jeff	Loth	Valencia	CA	91355
Zoe	Chapman	Whitethorn	CA	95589
Arvid	Knutson	Fallbrook	CA	92028
Roger	Hollander	Tarzana	CA	91356
Michele	De La Rosa	Santa Rosa	CA	95407
Fazilat	Ahmadi	Temecula	CA	92592
Jerry	Sullivan	Mount Shasta	CA	96067
Katlyn	Stranger	San Rafael	CA	94901
Jim	Humphrey	Playa Del Rey	CA	90293
Stephen	Ferry	Santa Barbara	CA	93111
Antonia & Anne	Chianis	Blue Jay	CA	92317
Daniel	Buckler	San Francisco	CA	94114
Karl	Twombly	Palm Desert	CA	92211
Elise	Bell	Emeryville	CA	94608
Thea	Doty	Sebastopol	CA	95472
J	Derden	Arcata	CA	95521
Matthew	Tritt	Atascadero	CA	93422
Ed	Attanasio	La Canada Flintridge	CA	91011
Norman And I	Wyman	Aptos	CA	95003
Kate	Robinson	Anaheim	CA	92801
Jason	Witchel	San Rafael	CA	94901
Ann	Rennacker	Fort Bragg	CA	95437
Art & Carol	Krakowsky	Livermore	CA	94550
Kevin	Shephard	Chico	CA	95928
Marjory	Clyne	San Diego	CA	92124
Denise	Lapides	Santa Cruz	CA	95060
Diana	Knowland	Rosamond	CA	93560

Juliette	Darvey	Temecula	CA	92592
Terry	Stauduhar	El Cerrito	CA	94530
Helen	Sanderson	Nevada City	CA	95959
Helen	Manning-Brown	Long Beach	CA	90807
Elizabeth	Fisher	Sacramento	CA	95825
Kanchana	Rao	San Francisco	CA	94102
Laticia	Lonon	San Francisco	CA	94112
Carolee	Kaplan	Santa Rosa	CA	95404
Paige	DeCino	Carlsbad	CA	92008
Christopher	Ware	Fremont	CA	94539
Kathy	Dainat	Carmichael	CA	95608
Jason	Halal	Oakland	CA	94609
Joan	Chatman	San Jose	CA	95120
Jana	Perinchief	Sacramento	CA	95821
Maggie	Hodges	Oakland	CA	94606
Tracy	Saucier	Petaluma	CA	94952
Gary	Gates	Santa Cruz	CA	95062
Maya	Morgan	Felton	CA	95018
Charles	Beals	Van Nuys	CA	91406
Rick	Degolia	Atherton	CA	94027
Julie	Brickell	Fullerton	CA	92832
Michael	Sheffield	Santa Rosa	CA	95409
David	Soares	Pollock Pines	CA	95726
Jocina	Pinkston	Ukiah	CA	95482
Sam	Parsons	Sacramento	CA	95826
Alexandra	Graziano	Thousand Oaks	CA	91360
Eloise	Newell	Sun City	CA	92586
Kathleen	Cridge	Rough And Ready	CA	95975
Edward	Sullivan	San Francisco	CA	94121
Diane	London	Woodland Hills	CA	91365
Marilyn	Shepherd	Trinidad	CA	95570
Victor	Kamendrowski	San Francisco	CA	94114
Leslie	Colyer	San Rafael	CA	94901
Kassahun	Asaye	Upland	CA	91784
James	Gonsman	Occidental	CA	95465
Michelle	King	San Juan Capistrano	CA	92675
Angela	Gunn	North Hollywood	CA	91601
Carol	Hewer	Ridgecrest	CA	93555
Jason	Wilson	Alameda	CA	94501
Michelle	Buyse	Oceanside	CA	92057
Dean	Arrighi	San Luis Obispo	CA	93401
Anthony	Condelli	Grover Beach	CA	93433
Raymond	Knauss	Rancho Palos Verdes	CA	90275
Cathy	Trejo	Covina	CA	91722
Paul	Klunder	La Honda	CA	94020
Yakau	Yermalitski	Mountain View	CA	94040
Ralph	Bocchetti	Fontana	CA	92337
James	Petkiewicz	San Jose	CA	95125
Kent	Minault	Sherman Oaks	CA	91423
Lynn	Elliott	Diamond Bar	CA	91765
Margaret	T.M. Petkiewicz	San Jose	CA	95125
Mecky & Jay	Myers	Redondo Beach	CA	90277
Richard	Klune	San Diego	CA	92124
Elizabeth	Thomsen	San Carlos	CA	94070
Sheila	Silan	Somerset	CA	95684
David	Lingren	El Cerrito	CA	94530
Robert	Reed	Laguna Beach	CA	92651
Mecky	Myers	Redondo Beach	CA	90277
Shannon	Patty	Riverside	CA	92509

Kathryn	Magallanes	Chatsworth	CA	91311
Dr. Rene	Cisneros, Ph.I	Fresno	CA	93705
Diana	Rodgers	Mission Viejo	CA	92691
Linda	Mclain	Lancaster	CA	93535
Iris	Chynoweth	Midpines	CA	95345
Joemarlin	Cotter	Pleasant Hill	CA	94523
Candy	Rand-Riley	San Diego	CA	92107
Sarah	Stiles	Santa Rosa	CA	95405
Robert	Magarian	Berkeley	CA	94701
Teresa	Edmonds	Carmel Valley	CA	93924
Anne	Lyon	Rohnert Park	CA	94928
Henry	Sanchez	Ojai	CA	93023
Denise	Vandermeer	Woodland Hill	CA	91367
Edward	Gutierrez	Millbrae	CA	94030
Robert	Mammon	El Sobrante	CA	94803
Almalee	Henderson	Berkeley	CA	94704
Phyllis	D'Anna	San Carlos	CA	94070
Dana	Weikel	Hanford	CA	93230
Ed	Giguere	Gold River	CA	95670
Donna	Donato	Sausalito	CA	94965
Denise	Lenardson	Sunland	CA	91040
Stuart	Hall	San Francisco	CA	94102
Marji	Parrish	Romoland	CA	92585
Todd	Bloom	Sacramento	CA	95817
Philip	Johnston	Scotts Valley	CA	95066
Burnett	Dougherty	Pacific Grove	CA	93950
Darynne	Jessler	Valley Village	CA	91607
Douglas	Thayer	Santa Rosa	CA	95403
Robert	Spaccarotelli	Claremont	CA	91711
Adriana	Hall	Pacifica	CA	94044
Angelica	Gomez	Los Angeles	CA	90044
Valerie	Selden	Los Angeles	CA	90034
Jan	Lockner	Sebastopol	CA	95472
Lizabeth	Flyer	Burbank	CA	91505
Wendy	Clifton	Ukiah	CA	95482
Kathleen	Kaiser	Chico	CA	95928
Kenneth	Kohler	Sacramento	CA	95838
Paul	Summers	Saratoga	CA	95070
Colleen	Hanlon	Los Angeles	CA	90049
Sander	Greenland	Topanga	CA	90290
Charles	Halpern	Berkeley	CA	94705
Chris	Einspar	Encinitas	CA	92024
Janet	Wheeler	Corona	CA	92879
Michael	Gomel	San Diego	CA	92115
Rodney	Hill	Grass Valley	CA	95949
James	Wells	Seal Beach	CA	90740
Dixie	Switzer	San Diego	CA	92126
Bryan	Lancaster	La Mesa	CA	91942
Michele	Sanderson	Walnut Creek	CA	94595
Pati	Jio	Castro Valley	CA	94546
Cary	Frazee	Eureka	CA	95503
Jill	Waters	Tracy	CA	95376
Lacey	Wozny	Los Angeles	CA	90027
Candy	Rocha	Los Angeles	CA	90033
Sonja	Derosé	Foresthill	CA	95631
Don	Lukenbill	Sherman Oak	CA	91403
Krista	Dana	Sunnyvale	CA	94087
Julie	Spengler	Palo Alto	CA	94306
Martha	Evans	Oakland	CA	94608

Robert	Mcdonnell	Westminster	CA	92683
Mary And Don	Mcmaster	Atwater	CA	95301
J. Chris	Kidney	Oakland	CA	94602
Lee	Greenwalt	Merced	CA	95340
Lynn	Pedersen	Northridge	CA	91326
Stephen	Miller	Benicia	CA	94510
Jon	Berges	San Clemente	CA	92673
Wendy	Walsh	Canoga Park	CA	91304
Kirk	Nason	Huntington B	CA	92648
Ken	Lamance	San Francisc	CA	94103
Steve	Spangler	Twain Harte	CA	95383
Tracy	Morrissey	Glendale	CA	91206
Thomas	Moynahan	San Jose	CA	95119
Victor	Carmichael	Pacifica	CA	94044
Angela T	Cannavo	Sunnyvale	CA	94089
Tony	Chapman	Camarillo	CA	93012
Nora	Mcbee	Concord	CA	94520
Diane	Knight	West Hills	CA	91307
Cindy	Warnock	Fair Oaks	CA	95628
Walter	Erhorn	Spring Valley	CA	91979
Howard	Higson	Sebastopol	CA	95472
Joemarlin	Cotter	Pleasant Hill	CA	94523
J Lhesli	Benedict	Nevada City	CA	95959
Theodora	Crawford	Berkeley	CA	94703
Doug	Van Wyck	Clayton	CA	94517
Jim	Tucker	Berkeley	CA	94704
Margie	Borchers	Santa Barbara	CA	93101
Perry	Gx	Tustin	CA	92780
Anita	Kreager	Chula Vista	CA	91910
Karron	Esmonde	Oceanside	CA	92056
Linda	Chandler	Rancho Cucar	CA	91730
John	Lalor	Fairfield	CA	94533
James	Samis	Rancho Palos	CA	90275
Lance	Robert	San Diego	CA	92101
Marvin	Sawyer	Yucca Valley	CA	92284
Getrude	Carney	Sacramento	CA	95864
Rosemarie	Shishkin	San Francisc	CA	94121
Edda	Spielmann	Santa Monica	CA	90405
F. Carlene	Reuscher	Costa Mesa	CA	92626
Hollis	Polk	Mill Valley	CA	94942
Maryanne	Steinberger	Tujunga	CA	91042
Mark	Takaro	Berkeley	CA	94702
Lynn	Graham	San Diego	CA	92129
Marian	Gould	Northridge	CA	91343
Catherine	Corwin	Santa Monica	CA	90404
Carolyn	Seeman	Valley Village	CA	91607
Diane	Chapman	Pescadero	CA	94060
Bernard	Hochendoner	Patterson	CA	95363
Sharon	Rodrigues	Fremont	CA	94539
Naomi	Lidicker	Kensington	CA	94707
Philip	Mcmorrow	Calabasas	CA	91301
Kevin	Lee	Modesto	CA	95350
James	Lindgren	Cerritos	CA	90703
Vera	Brown	Redwood City	CA	94065
Joe	Mclaughlin	Los Angeles	CA	90026
Yefim	Maizel	San Francisc	CA	94131
Marian	Isaac	Modesto	CA	95354
Elizabeth	Steinfeld	Santa Rosa	CA	95401
Dianne	Busse	Pacific Grove	CA	93950

Katherine	Perkins	Altadena	CA	91001
Tamara	Namay	Redondo Beach	CA	90278
Faith	Herschler	Stanton	CA	90680
Michele Dawn	Sanderson	Walnut Creek	CA	94595
Jane	MacFarlane	Los Angeles	CA	90010
Rebecca	Egger	Berkeley	CA	94705
Karen	Cusolito	Los Angeles	CA	90039
Scott	Rubel	Los Angeles	CA	90031
Pat	Thompson	Roseville	CA	95678
Thomas	Infusino	Pine Grove	CA	95665
Cara	Barnhill	Coarsegold	CA	93614
Daniel	Margolis	Los Angeles	CA	90024
Zoila	Hillier	Temecula	CA	92592
Matthew	Reis	Los Angeles	CA	90046
Cindy	Meyers	La Selva Beach	CA	95076
Kirk	Wilcox	Richmond	CA	94805
Anna	Narbutovskih	Guerneville	CA	95446
Carol	Hirth	Berkeley	CA	94702
Elizabeth	Edwards	Newport Beach	CA	92660
Sandra	Briggs	Riverside	CA	92506
Stephanie	Bianca	Chatsworth	CA	91311
Valerie	Schadt	Los Angeles	CA	90045
Rachel	Kohn	Alta Loma	CA	91701
Rachel	Kohn	Alta Loma	CA	91701
Aretta	Covington	Los Angeles	CA	90008
Adele	Kapp	La Jolla	CA	92037
Lani	Arellanes	Petaluma	CA	94954
Mark	Howard	Berry Creek	CA	95916
Lenore	Rodah	South Pasadena	CA	91030
Francine	Kubrin	Los Angeles	CA	90049
Peggy	Stap	Monterey	CA	93942
Jason	Batten	Los Angeles	CA	90027
Jack	Waddington	Los Angeles	CA	90066
Charlotte	Gray	Hemet	CA	92544
Barbara	Sharma	Los Angeles	CA	90029
Kevin	Wang	Turlock	CA	95382
Kathleen	Fisher	Camarillo	CA	93012
Susan	Breitbard	Palo Alto	CA	94306
Patrick	Barrows	San Diego	CA	92106
Rosie	Cerda	La Mesa	CA	91941
Randy	Hawker	Shadow Hills	CA	91040
Linda	Black	Capo Beach	CA	92624
Robert	Reingold	Foster City	CA	94404
Sylvia	Ruiz	Los Angeles	CA	90086
Moses	Gonzales	Pico Rivera	CA	90662
Jennifer	Norris	Calistoga	CA	94515
Carol	Plantamura	San Diego	CA	92121
nancy	mendiburu	san diego	CA	92154
William	Ramos	Hayward	CA	94541
Lindsay	Mugglestone	Berkeley	CA	94705
Sandy	Hall	Fountain Valley	CA	92708
Julie	Alicea	Denair	CA	95316
Ellen	Koivisto	San Francisco	CA	94122
Victoria	Francis	Los Angeles	CA	90031
Jamie	Green	Ventura	CA	93004
Warren	Clark	Mammoth Lake	CA	93546
Randy	Nelsen	Lancaster	CA	93536
John	Garcia	Carlsbad	CA	92011
Jeanette	Meeker	Sacramento	CA	95825

Yolanda	Trujillo	Anaheim	CA	92807
Jay	Govind	Boulder Creek	CA	95006
Richard	Lee	Salinas	CA	93907
Jody	Kay	Rossmore	CA	90720
Christina	Hauswald	Kelseyville	CA	95451
Catherine	Carothers	San Diego	CA	92110
Dina	Brown	Valley Village	CA	91601
Jan	Beeman	Guerneville	CA	95446
Steve	Andre	Santa Rosa	CA	95405
Darrell	Clarke	Pasadena	CA	91101
Judie	Van Leeuwen	Boulder Creek	CA	95006
Nancy	Cohn	Atascadero	CA	93422
Dana	Penoff	Santa Barbara	CA	93105
Alwen	Bauer	Palos Verdes	CA	90274
Edwin	Schmidtke	Valley Village	CA	91607
Burt	Torgan	Kensington	CA	94707
Babette Barbi	Beaudette	Sacramento	CA	95826
David	Zebker	San Francisco	CA	94102
Jena	Hallmark	Temecula	CA	92592
Jessica	Paolini	Santa Clarita	CA	91355
Carol	Knight	Palo Alto	CA	94306
Judith	Hoaglund	Santa Rosa	CA	95401
Terry	Badger	Paso Robles	CA	93446
Mark	Ricci	Point Arena	CA	95468
Cindy	Corona	Chino Hills	CA	91709
Nic	Larsen	Los Angeles	CA	90032
Pat	Turney	Hayward	CA	94542
Allan	Lichtenberg	Berkeley	CA	94708
Charleen	Kubota	Oakland	CA	94611
John	Lawler	Magalia	CA	95954
Lauri	Steel	Los Altos	CA	94024
Carolyn	Phares	San Luis Obispo	CA	93405
Patricia	Grogan	Glendale	CA	91202
Greg	Schwartz	San Rafael	CA	94903
Christopher	Prieto	San Diego	CA	92105
Janet	Miller	Sherman Oaks	CA	91423
Arline	Fernandez	Fallbrook	CA	92028
Cheryl	Jenkins	Penn Valley	CA	95946
Susan	Dunn	Grass Valley	CA	95945
Richard	Partlow	Altadena	CA	91001
Michael	Gordon	Long Beach	CA	90813
Michal	Lynch	Santa Barbara	CA	93111
Remi	Gauchet	Lake Forest	CA	92630
Kristen	Ostro	San Francisco	CA	94131
Nina	Adel	San Diego	CA	92131
Alan	Butts	Granada Hills	CA	91344
Ferdinand	Brislawn	Piedmont	CA	94610
Carol	Roche	Napa	CA	94558
Jim	Alexander	Berkeley	CA	94703
Janie	Lucas	San Francisco	CA	94110
Barbara	Thornbury	Monterey	CA	93942
Michael	Gilgun	Chula Vista	CA	91911
Jeanne	Sumner	Laytonville	CA	95454
Chris	Bongardt	Rohnert Park	CA	94928
Julia	Jones	Carlsbad	CA	92011
Maurice	Warren	Laguna Wood	CA	92637
Lynn	Locher	Fremont	CA	94539
Carol	Kirk	Napa	CA	94558
Sandy	Kasper	Hemet	CA	92544

Jan	Kimbrough	Valley Village CA	91607
Dawna	Knapp	Citrus Height: CA	95621
N	W	Grass Valley CA	95949
Liz	Myers-Chambliss	Carlsbad CA	92009
Liz	Swanson	Mission Viejo CA	92692
Dana	Hinkle	Red Bluff CA	96080
Marlene Maes	Mills	Santa Barbara: CA	93111
Gary	Reese	San Clemente CA	92673
Jean	Cochran	Pomona CA	91767
Carol	Gerratana	Joshua Tree CA	92252
Cindi	Lund	Danville CA	94526
Julianne	Jensen	Daly City CA	94014
Tanya	Wilson	Glendale CA	91202
Ronit	Corry	Santa Barbara: CA	93101
Amber	Archangel	Carmel CA	93921
Carol	Brady	Alameda CA	94501
John	Beal	San Bruno CA	94066
Karen	Valentine	Soquel CA	95073
MICHELE DAVIS	SANDERSON	Walnut Creek CA	94595
Amanda	Glover	Venice CA	90291
Robin	Florentine	Sunnyvale CA	94087
Eleanor	Thomas	Livermore CA	94550
Susan	Rowe	Coarsegold CA	93614
Jeffrey	Hemenez	San Ramon CA	94583
Madeleine	Krois	San Francisco CA	94122
Martin	Jones	Guerneville CA	95446
James	Krenzke	Sun Valley CA	91352
Jane	Engelsiepen	Carpinteria CA	93013
Eric	Jensen	Pasadena CA	91101
Ashni	Akand	Fort Bragg CA	95437
Kim	Nero	Costa Mesa CA	92627
Ann	Hubbard	Lucerne CA	95458
Tracey	Link	Solana Beach CA	92075
Jack	Sparks	Daly City CA	94015
Robin	Delacey	Angelus Oaks CA	92305
William	Leblanc	Pine Valley CA	91962
Daniel	Gonzales	Lancaster CA	93536
Qui	Vuong	Rancho Mirag CA	92270
Andrew	Vahldieck	Santa Cruz CA	95060
Cesar	Reategui	Laguna Hills CA	92653
Jean	Pappalardo	Los Angeles CA	90066
Stephanie	Reader	Los Altos CA	94024
Julia	Adkins	Napa CA	94559
Brian	Espy	Morro Bay CA	93442
Barbara	West	Cupertino CA	95014
Laura	Craun	Bakersfield CA	93311
Milton	Carrigan	San Luis Obis CA	93401
Patricia	Zyllus	Santa Cruz CA	95062
Austin	Fite	Pacific Palisac CA	90272
Cathy	Crum	Agoura Hills CA	91301
Chris	McCluskey	San Jose CA	95112
Ct	Bross	Walnut Creek CA	94597
Carmen	Gagne	Watsonville CA	95076
Yves	Decargouet	Lucerne CA	95458
Rollin	Odell	Orinda CA	94563
Timothy	Goodman	Cerritos CA	90703
Kristina	Fukuda-Schmidt	Los Angeles CA	90034
Rich	Ruff	North Hollywood CA	91601
Ruth	Farnsworth	San Jose CA	95134

Ellen	Frank	San Francisc	CA	94134
Ioana	Sfrengeu	Roseville	CA	95747
Michelle	Parodi	San Francisc	CA	94112
Mary	Novasic	San Francisc	CA	94118
Rick	Shreve	Weott	CA	95571
Sarah	Paul	Kensington	CA	94707
Benjamin	Leslie	Apple Valley	CA	92307
Keith	Bein	Oakland	CA	94602
Stacy	Cornelius	Laguna Beach	CA	92651
Lisa	Quane	Tustin	CA	92782
Gregory	Tabat	Santa Ana	CA	92704
Lisa	Lashaway	Montrose	CA	91020
Claire	Sapiro	Kenwood	CA	95452
Rowan	Sherwood	Albany	CA	94706
Connie	Peabody	Petaluma	CA	94952
Joslyn	Baxter	San Francisc	CA	94118
Carol	Shapiro	Auburn	CA	95603
Jon	Davison	Laguna Beach	CA	92651
Andrew	Bordner	San Jose	CA	95129
Ron	Calvisi	Toluca Lake	CA	91602
Elizabeth	Sullivan	Penngrove	CA	94951
Gerard	Ridella	Castro Valley	CA	94546
Suzette	Welch	Chico	CA	95926
John M	Keefe	South Pasade	CA	91030
Winston	Tormos	Apple Valley	CA	92308
Emma	Wright	San Diego	CA	92103
Jack	Milton	Davis	CA	95616
Claudia	Wornum	Oakland	CA	94605
Luisa	Agostini	San Francisc	CA	94132
Patrick	Twomey	Oakland	CA	94611
Tim	Murphy	Toluca Lake	CA	91602
Skye	Peace	Sherman Oak	CA	91403
Sid	Johnson	La Canada Fli	CA	91011
Roger	Runnoe	Oakland	CA	94611
Nadya	Schmeder	Napa	CA	94559
Ida	Hurt	Chatsworth	CA	91311
Barbara	Beery	Oakland	CA	94611
Gary	Baxel	Cathedral City	CA	92234
Carrie	Altintop	Clovis	CA	93619
Gilbert	Blount	San Clemente	CA	92673
Lynne	Preston	San Francisc	CA	94107
Joan	Goulden	Los Angeles	CA	90005
Katrina	Frey	Redwood Vall	CA	95470
Bitia	Edwards	Woodacre	CA	94973
Hugh	O'Donovan	Los Angeles	CA	90042
Esther	Briceno	Indio	CA	92203
Nicole	Aggreh	Palo Alto	CA	94306
Blake	Wu	Lafayette	CA	94549
Frank	Poppie	Monterey Park	CA	91755
Richard	Hoff	Occidental	CA	95465
Katherine	Nolan	Cupertino	CA	95014
Pauline	Bedford	Joshua Tree	CA	92252
Maureen	Mcdonald	Los Angeles	CA	90068
Janice	Gloe	Oakland	CA	94602
Joyce	Johnson	Oroville	CA	95966
Judith	Little	Arcata	CA	95521
Laura	Nix	Los Angeles	CA	90027
Shara	Marin	Fontana	CA	92336
Glenn	Finch	Sebastopol	CA	95472

Ted	Hoffman	Fort Jones	CA	96032
Louise	Anderson	Oakland	CA	94610
Beverly	Allphin	Berkeley	CA	94703
L.	Olson	San Francisc	CA	94104
Evie	Kosower	San Diego	CA	92105
Gene	Kostruba	Mountain View	CA	94043
Jesse	Abrams	Irvine	CA	92614
Patsy	Lowe	Simi Valley	CA	93065
Robert	Younkin	Fountain Valley	CA	92708
Sally	Maier	Livermore	CA	94550
Laine	Gonzales	Fallbrook	CA	92028
Irene	Snively	Covina	CA	91724
Eric	Olberz	La Canada	CA	91012
Karin	Peck	Carmichael	CA	95608
Larry	Powell	Culver City	CA	90230
Clyde	Burton	San Jose	CA	95122
Richard	Bold	Vista	CA	92084
Nicole	Amador	Sacramento	CA	95818
Alvin	Johnson	Broderick	CA	95605
Frank B.	Anderson	San Pedro	CA	90731
Christopher	Lovett	Los Angeles	CA	90066
Marjory	Keenan	Berkeley	CA	94703
Frank	Fellenz	San Jose	CA	95124
Janice	Jones	El Cerrito	CA	94530
Sherrill	Futrell	Davis	CA	95618
Craig	Antrim	San Pedro	CA	90731
Dan	Hampshire	San Francisc	CA	94107
Lisa Ann	Kelly & Famil	Santa Barbara	CA	93101
Scott	Cookson	Encinitas	CA	92024
Rosalind	John	Irvine	CA	92602
Timothy F.	Isaacs	Santa Cruz	CA	95062
Carol	Mock	Fremont	CA	94536
George	Galamba	Davis	CA	95618
Teri	Sigler	Santa Cruz	CA	95060
David	Boyer	Palo Alto	CA	94304
Ulrike	Silkey	Oakland	CA	94602
Ian	Nelson	Santa Rosa	CA	95403
Douglas	Morgan	San Pedro	CA	90732
Brian	Yu	Santa Monica	CA	90404
Carlos	Cabezud	San Ysidro	CA	92143
Donald	Coburn	Napa	CA	94559
Ed	Van Den Boss	Newport Beach	CA	92663
Sandra	Mcperson	Davis	CA	95616
Bobbi	Monnette	Saint Helena	CA	94573
Kathleen	Mcmullen	Belmont	CA	94002
Nancy	Haiston	Forestville	CA	95436
Ronald	McNay	Pebble Beach	CA	93953
Carole	Gonsalves	San Jose	CA	95120
Elisha	Holden	Los Angeles	CA	90026
Arlene	Merryman	Berkeley	CA	94705
Judith	Schaab	Morro Bay	CA	93442
Joseph	Mirabile	San Francisc	CA	94122
Alexander	Yeung	Clovis	CA	93619
Irene	Cunningham	Buellton	CA	93427
Zeinob	Burnham	Capitola	CA	95010
Dianne	Rowe	San Francisc	CA	94123
Dianne	Rowe	San Francisc	CA	94123
Ronald	Brown	Palm Desert	CA	92211
Ann	Bein	Los Angeles	CA	90064

Blanche	Korfmacher	San Francisc	CA	94132
Joseph	Catania	Fresno	CA	93728
Leslie	Hendricks	San Francisc	CA	94122
Kristin	Andersen	Fullerton	CA	92833
Ashley	Felix	Riverside	CA	92506
Brian	Cocco	San Francisc	CA	94134
Irene	Hilgers	San Ramon	CA	94582
Annette	Cadosi Wilsor	Healdsburg	CA	95448
Craig	Walker	Glendale	CA	91206
Ted	Fishman	San Jose	CA	95123
Connie	Hannah	Goleta	CA	93117
Janet	Heck	Laguna Hills	CA	92653
Heather	Vollstedt	Carmichael	CA	95608
Amanda	Robertson	Mount Shasta	CA	96067
Sean	Wayland	Rohnert Park	CA	94928
Robert	Chirpin	Northridge	CA	91324
Tracy	Sundstrand	Sonora	CA	95370
Roberta	Morrow-Jones	Fort Bragg	CA	95437
John	Michno	San Diego	CA	92126
Gregg	Norman	Santa Monica	CA	90405
Sharon	Sims	Windsor	CA	95492
Ann & Robert	Tait	Pasadena	CA	91104
Julie	Pizzo	Corte Madera	CA	94925
Betsy	Eudey	Twain Harte	CA	95383
Anthony	Jammal	Roseville	CA	95661
Patricia	Speier	Berkeley	CA	94705
Bonnie	Jackson	Corning	CA	96021
Sarah	Leonard	Berkeley	CA	94707
Billie Lee	Langley	Torrance	CA	90501
Gary and Ser	Landgrebe	Soquel	CA	95073
Joann	Nazworthy	Rancho Cord	CA	95670
Karen	Kirschling	San Francisc	CA	94117
Michelle	Huizar	Pomona	CA	91767
Raydon	Gordon	San Jose	CA	95123
Tina	Ann	Bolinas	CA	94924
Jamie	Weber	Sierra Madre	CA	91024
Elizabeth	Larkin	San Marcos	CA	92078
Rebecca	Harper	Los Angeles	CA	90049
Larry	Branson	Pomona	CA	91767
Susan	Wayne	San Bernardi	CA	92407
Shelley	Strohm	Los Angeles	CA	90025
Walter	Helm	Sacramento	CA	95821
Dave	Rawcliffe	Pleasanton	CA	94566
Dunham	Sherer	Occidental	CA	95465
Chris	Worcester	Truckee	CA	96160
Christopher	Horner	Santa Barbar	CA	93108
Carrie	Staton	Santa Cruz	CA	95060
John	Bertaina	San Jose	CA	95139
Sharon	Bills	Van Nuys	CA	91406
Craig	Drizin	Santa Cruz	CA	95060
Gail Eva	Young	Santa Rosa	CA	95404
Charles	Griffin	Harbor City	CA	90710
Zsanine	Alexander	Burbank	CA	91504
Kim	Floyd	Palm Desert	CA	92260
Cynthia	Florenzen	Healdsburg	CA	95448
Jeffrey	Smith	San Diego	CA	92116
Robert	Bauer	Stockton	CA	95207
Lori	Slater	Cambria	CA	93428
Elizabeth	Wharton	Oakland	CA	94619

Sylvia	Sullivan	Goleta	CA	93117
Kathleen	Feeley	Nevada City	CA	95959
Rick	Guidotti	Los Angeles	CA	90068
John	Nowak	Santa Ana	CA	92704
Jonathan	Hammond	Winters	CA	95694
Leslie	Alexander	San Francisc	CA	94109
Kira	schabram	Valley Spring	CA	95252
Paula	Hartgraves	Dublin	CA	94568
Anastasia	Yovanopoulos	San Francisc	CA	94114
Janice	Girocco	San Diego	CA	92131
David	Figur	San Mateo	CA	94403
Marlyne	Hadley	Clayton	CA	94517
Isabel	Contreras	Arcata	CA	95521
Vanessa	Chrisman	Huntington B	CA	92649
Vanessa	Chrisman	Huntington B	CA	92649
Jen	Young	West Hollywo	CA	90069
Susan	Levy	San Francisc	CA	94131
Thania	Gonzalez	Palmdale	CA	93552
E.H.	Estes	Mountain Vie	CA	94041
Don	Petersen	Pleasanton	CA	94566
Rita	Alderucci	San Francisc	CA	94115
Ayesha	Vavrek	Berkeley	CA	94704
Alice	Kelly	Felton	CA	95018
Mary	Rodgers	Menlo Park	CA	94025
Victoria	Brandon	Northridge	CA	91325
Paulina	Garcia-Macdo	Simi Valley	CA	93065
Alfred	Cellier	Rancho Palos	CA	90275
Jessica	Landon	Long Beach	CA	90802
Joann	Ross	Carmichael	CA	95608
Alice	Neuhauser	Manhattan B	CA	90266
Patrick	Kidd	Ben Lomond	CA	95005
Thomas	Conroy	Manhattan B	CA	90266
Diana	Shreves	Vista	CA	92084
Laura	Daniels	Cambria	CA	93428
Laura	Daniels	Cambria	CA	93428
Jeri	Bodemar	Watsonville	CA	95076
Linda	Owczarz	Oakland	CA	94605
James	Smith	Watsonville	CA	95076
Carroll	Boone	La Mesa	CA	91942
Magda	Paiva	North Hollyw	CA	91602
Martin	Henderson	Goleta	CA	93117
cameron	keep	cathedral city	CA	92234
Ed	Elliott	Ben Lomond	CA	95005
Tom	Falvey	San Diego	CA	92104
Julia	Javrotsky	San Rafael	CA	94903
Allen	Leinwand	San Jose	CA	95124
Kathryn	Spence	Moraga	CA	94556
Mike	Ovard	Long Beach	CA	90815
Sue	Davies	Philo	CA	95466
Joanna	Williams	Berkeley	CA	94705
Susan	Ryals	Redwood City	CA	94061
Katrina	Stimson	Long Beach	CA	90813
Chris	Loo	Morgan Hill	CA	95037
Jeanette	Snow	Oceanside	CA	92058
Leonard	Bruckman	Granite Bay	CA	95746
Haydee	Felsovanyi	Pescadero	CA	94060
Lesley	Pillsbury	Petaluma	CA	94954
Virgie	Smith	Yucca Valley	CA	92284
Barbara	Bersell	Los Angeles	CA	90064

Jon	Porter Md	Los Alamitos	CA	90720
Dale	Riehart	San Francisc	CA	94107
Lori	Berezin	Malibu	CA	90265
Suzanne	Jones	Huntington B	CA	92605
Nick	Moidja	Gold River	CA	95670
Barbara	Murray	Los Angeles	CA	90041
L B	Nelson	Morgan Hill	CA	95038
Carol	Carges	San Francisc	CA	94115
Grace	Johnson	San Diego	CA	92117
Fred	Mauck	Palm Desert	CA	92260
Carla	Davis	Corte Madera	CA	94925
Antoinette	Daniel	Ukiah	CA	95482
Paul	Aagaard	Thousand Oal	CA	91362
Sharon	Levine	Simi Valley	CA	93063
Denis	Petitt	Burbank	CA	91505
Alicia	Salazar	Los Angeles	CA	90032
Ed	Aiken	Sunnyvale	CA	94087
Patricia	Krout	Santa Barbar	CA	93190
Lee	Anke	Vista	CA	92081
Stuart	Niebel	Ojai	CA	93023
Marisa	Strange	Long Beach	CA	90803
Joel	Sokolsky	Walnut Creek	CA	94595
T	Welch	Beverly Hills	CA	90213
Ron	Tindall	Atascadero	CA	93422
Richard	Mcmanus	Guatay	CA	91931
Peggy	Woodin	Oroville	CA	95966
Kate	Burroughs	Sebastopol	CA	95472
Jennie	Rozzell	Newport Beac	CA	92663
Loren	Hall	Sebastopol	CA	95472
Barbara	Bibel	Berkeley	CA	94708
John	Angel	San Francisc	CA	94134
Ryan	King	Tulare	CA	93274
Joseph	Melvin	Redding	CA	96003
Frederick	Hamilton	Rancho Cucar	CA	91739
Martin	Saitta	San Diego	CA	92115
Larry	Bailey	Redding	CA	96099
Corey	Jaseph	El Dorado Hill	CA	95762
Carrie	Altintop	Carrie	CA	93619
Dorothy	Wilkinson	Los Angeles	CA	90027
Lindsay	Golter	Laguna Beach	CA	92652
Karen	Osmundson	Watsonville	CA	95076
Karen	Osmundson	Watsonville	CA	95076
Karen	Osmundson	Watsonville	CA	95076
Arthur	Squillante	Castro Valley	CA	94546
Karen	Nilsen	Ben Lomond	CA	95005
Marilyn	Pisa	Valencia	CA	91355
Ramsey	Eldib	Granada Hills	CA	91344
Cheryl	Desautell	Pasadena	CA	91101
Marisa	Davis	Los Angeles	CA	90041
Vivek	Krishnappa	Palo Alto	CA	94301
Tomas	Hakanson	Sebastopol	CA	95472
Lauren	Stoneburner	Rancho Palos	CA	90275
Katia	Briere	San Carlos	CA	94070
Brendan	Gallagher	Novato	CA	94949
Laura	Galligan	Berkeley	CA	94703
Michael	Destefano	Vista	CA	92084
Susan	Christopher	Laguna Wood	CA	92637
Constance	Sutton	Berkeley	CA	94707
Ted	Cheeseman	Santa Cruz	CA	95060

Malc	Moore	Portola	CA	96122
John	Mclaurin	Paso Robles	CA	93446
Vic	Amoroso	Bolinas	CA	94924
Garrett	Murphy	Oakland	CA	94612
Anne	Ehrlich	Stanford	CA	94305
Terrie	Weiss	San Lorenzo	CA	94580
Michael and A	Wylie	Novato	CA	94945
Marsha	Epstein	Los Angeles	CA	90066
Amy	Pfaffman	San Geronimo	CA	94963
Terence	Fetterman	Los Gatos	CA	95033
Russell B.	Sperry	Ventura	CA	93003
Ann	Pinkerton	Oakland	CA	94618
Ann	Pinkerton	Oakland	CA	94618
Susan	Willhoit	Cardiff By the	CA	92007
Colleen	Ayotte	Santa Cruz	CA	95062
Robert	Soto	La Quinta	CA	92253
Jo-Ann	Savoia	Pasadena	CA	91104
Lisa	Canning	San Diego	CA	92126
Carol	Weinstock	Oxnard	CA	93035
Heidi	Miller	North Hills	CA	91343
Kirby	Hammel	El Cerrito	CA	94530
Thomas	Grasshoff	San Francisc	CA	94116
Diane	Himes	Walnut Creek	CA	94597
Michael	Marangio	Richmond	CA	94804
Gerrit	Woudstra	Pasadena	CA	91126
Jesse	Reisch	Sebastopol	CA	95472
Enid	Emde	Pacifica	CA	94044
Grace	Padelford	Los Angeles	CA	90064
Howard	Strauss	Culver City	CA	90232
Emily	Betts	Petaluma	CA	94952
Janet	Carlson	Fresno	CA	93726
Fred	Cox	San Francisc	CA	94114
Gloriamarie	Amalfitano	San Diego	CA	92111
Melissa	Miller	Pleasant Hill	CA	94523
Linda	Lyke	Los Angeles	CA	90065
Carol	Corethers Bo	El Cajon	CA	92021
Janet	Lott	Fairfax	CA	94978
Dorothy	Rossi	Carmichael	CA	95608
Christine	Raffetto	Healdsburg	CA	95448
David	Baca	Berkeley	CA	94720
Angie	Emery	Indio	CA	92201
Carol Anna	Lind	San Francisc	CA	94117
Linda	Lyerly	Cardiff By the	CA	92007
Eric	Ramstrom	Redding	CA	96002
Bruce	England	Mountain View	CA	94043
Shanti	Cabinaw	Santa Rosa	CA	95405
Yvonne	Jue	Sunnyvale	CA	94087
Gabriel	Abraham	Venice	CA	90291
Leslie	Mihordin	Sacramento	CA	95831
M	Hess	Fullerton	CA	92831
Roberta	Reed	Huntington B	CA	92648
Paul	Judy	Van Nuys	CA	91405
Danielle	Taylor	San Diego	CA	92115
Tina	Peak	Palo Alto	CA	94301
Leslie	Waltzer	Trinidad	CA	95570
Lauren	Linda	Laguna Wood	CA	92637
Nadya	Tichman	Oakland	CA	94602
Leslie	Andrews	Santa Cruz	CA	95060
Jack and Mar	Denman	Fullerton	CA	92838

Jerome	Deaver	Bakersfield	CA	93307
Andrea	Nemeth	Santee	CA	92071
Roger	Lundgren	Santa Clara	CA	95051
Ollin	Doyle	Sacramento	CA	95841
Michael	Garden	Sacramento	CA	95825
Mira	Jovanovic	San Diego	CA	92117
Marina	Kocherovsky	Placerville	CA	95667
Helen	Keenan	San Mateo	CA	94403
Julie	Watt	Mountain View	CA	94041
Michael	Cardoza	Los Angeles	CA	90032
John	Ota	Alameda	CA	94501
Ricardo	Frustockl	Santa Barbara	CA	93120
Gregory	Morse	Long Beach	CA	90803
Malcolm	Moore	Portola	CA	96122
Sarah	Valentine	Saratoga	CA	95070
Priscilla	Klemic	Sherman Oak	CA	91401
Barbara	Gersh	San Francisco	CA	94134
Dalia	Salgado	Los Angeles	CA	90015
Meleina	Mayhew	Los Angeles	CA	90039
Meghan	Hughes	San Dimas	CA	91773
Robert	Snyder	Rancho Palos	CA	90275
Sadie	Bailey	Huntington B	CA	92648
Anthony	Montapert	Ventura	CA	93004
Sarah	Kaplan	Oakland	CA	94609
Robert	Mize	Inyokern	CA	93527
Catherine	Mcbride	Santa Rosa	CA	95405
Dorothy	Lebovitz	Upland	CA	91784
Edmund	Wright	Trinidad	CA	95570
Donald	Pieper	Arroyo Grand	CA	93420
Joan	Hebert	Menlo Park	CA	94025
Randall	Woodbury	Sebastopol	CA	95472
Caroll	Garrison	Cherry Valley	CA	92223
Joseph	Rodriguez	Sacramento	CA	95835
Victoria	Dreifuss	Occidental	CA	95465
Jennifer	Taketani	West Hills	CA	91304
Allie	Palmer	San Clemente	CA	92672
Sylvia	Cardella	Hydesville	CA	95547
Mark & Susar	Glasser	Los Angeles	CA	90066
Alan	Cunningham,	Carmel Valley	CA	93924
Shanna	Bennington	Redondo Bea	CA	90278
Diane Rebecc	Martin	Seal Beach	CA	90740
Roger	Lang	Concord	CA	94518
Kat	Gelles	San Francisco	CA	94116
Rj	Alexander	Riverside	CA	92504
Bob	Wellsted	Concord	CA	94521
David	Zaccagnino	Upland	CA	91786
Rachel	Zanetti	Encinitas	CA	92024
Nancy	Attanasio	La Canada Fli	CA	91011
George	Holloway	Stevenson Ra	CA	91381
Ashley Elizab	Allen	Long Beach	CA	90813
Julie	Matthews	Los Gatos	CA	95032
John	Peterson	Temecula	CA	92592
Linda	Donahue	Shingletown	CA	96088
Wendy	Weikel	Berkeley	CA	94707
Kory	Mcfarland	Salinas	CA	93906
Erik	Kemper	Mission Viejo	CA	92692
George	Chadderton	San Ramon	CA	94583
Barry	Weinzveg	Petaluma	CA	94952
Robert L	Oman	Sylmar	CA	91342

Sage	Johnson	San Francisc	CA	94133
Kristen	Renton	Valencia	CA	91354
Stephen	Treiman	Arcadia	CA	91006
Gloria	Smestad	Chula Vista	CA	91915
Judith	Mayer	Arcata	CA	95521
Mark	Miles	San Francisc	CA	94131
Lanier	Sammons	Santa Cruz	CA	95060
Laura	Ware	San Francisc	CA	94121
Fran	Swolgaard	Huntington B	CA	92647
Suzanne	A'Becket	Cupertino	CA	95014
Dulce	Twist	San Diego	CA	92124
Nikki	Nicola	Davis	CA	95616
C. Alton	Robertson	Redlands	CA	92373
M	May	Carlsbad	CA	92008
J Federico	Martin	Los Angeles	CA	90036
Nancy	Holleman	Santa Ana	CA	92705
Elaine	Hirtle	Alameda	CA	94501
Deborah	Fallender	Santa Monica	CA	90405
Indee	Brooke	Sunland	CA	91040
Christina	Navarro	San Francisc	CA	94114
Lee	Backus	Simi Valley	CA	93063
Jonathon	Ray	Glendale	CA	91203
Carol	Hilton	Oceanside	CA	92056
Dianne	Miller	San Diego	CA	92103
Stephanie	Nunez	Van Nuys	CA	91405
Abril	Gutierrez	National City	CA	91950
Leonard	Foreman	Santa Cruz	CA	95065
David	Enevoldsen	San Jose	CA	95127
Mauro	Ferrero	Los Angeles	CA	90045
S	Smith	Corona	CA	92879
Angella L	Thorne	Sonora	CA	95370
Paul	Andrade	Santa Cruz	CA	95060
Henry	Morgen	Los Angeles	CA	90019
Rose	Glickman	Berkeley	CA	94710
Christine	Brazis	San Francisc	CA	94110
George	Stewart	Santa Rosa	CA	95409
Linda	Adams	San Rafael	CA	94903
Stanley	Peterson	Los Banos	CA	93635
Lauren	Britton	Montara	CA	94037
Helen	Shelton	Apple Valley	CA	92307
Jo Ellen	Young	Culver City	CA	90230
Rochelle	La Frinere	San Diego	CA	92114
Gail	Angevine	San Pedro	CA	90732
Lyn	Burke	Laguna Nigue	CA	92677
James	Potter	San Diego	CA	92114
Ben	Holmes	San Francisc	CA	94117
Carri	Woolsey	Santa Rosa	CA	95409
Devin	Romero	San Francisc	CA	94118
Robert	Gillette	Arroyo Grand	CA	93420
Eva	Hedberg	Los Angeles	CA	90027
Scott	Akemon	Oakland	CA	94619
Julienne	May	Los Angeles	CA	90034
Veronica	Tucker	Santa Monica	CA	90405
Ashley	Mccutchan	Manteca	CA	95337
Erin	Millikin	San Diego	CA	92154
Deanne	Conroy	Rancho Cucar	CA	91730
Casey	Martinez	San Francisc	CA	94122
Alan	Blackman	San Francisc	CA	94114
Joan	Zawaski	Oakland	CA	94602

Mignon	Moskowitz	Bishop	CA	93514
Thomas	Canning	Calabasas	CA	91302
Shana	Van Meter	Irvine	CA	92614
Gerald	Lysne	Encinitas	CA	92024
Joan	Greenwald	Los Angeles	CA	90049
Derald	Myers	Santa Cruz	CA	95062
Lincoln	Wallace	Moss Beach	CA	94038
Chrissy	Sepulveda	Anaheim	CA	92802
Neil	Ferguson	Vacaville	CA	95688
Dennis	Lynch	Felton	CA	95018
Angela	Orozco	San Francisc	CA	94117
Tim	Dufka	San Francisc	CA	94117
Jessica	Wohlander	Oakland	CA	94606
Sandra	Fernandez	Los Angeles	CA	90004
Marie	Marshall	Dublin	CA	94568
Ellen	Dollar	San Luis Obis	CA	93401
Lindsay	Knights	Santa Cruz	CA	95061
Michelle	Le	Anaheim	CA	92804
Samuel	Austin	Guerneville	CA	95446
Grace	Huenemann	San Francisc	CA	94107
Mavis	Petra	Mountain Vie	CA	94040
Paul	Chase	Los Angeles	CA	90066
Raymond	Katz	Larkspur	CA	94939
Raymond	Katz	Larkspur	CA	94939
Dennis	Lees	Encinitas	CA	92024
Estelle	Moulton	Los Gatos	CA	95031
Lee	Eils	Danville	CA	94526
Jo	Turner	Riverside	CA	92507
Elizabeth	Pataki	Sacramento	CA	95828
William	Remsen	San Diego	CA	92109
Ken	Lucas	Westminster	CA	92683
William	Piercy	San Francisc	CA	94127
Cathie	Messenger	Costa Mesa	CA	92626
Bonnie	Strand	Glendale	CA	91202
Sharlee	Moore	Los Angeles	CA	90013
Colleen	Kandus	Temecula	CA	92591
Janet	Lorraine	Santa Rosa	CA	95407
Branden	Faber	Laguna Beach	CA	92651
Annie	Kaskade	Woodside	CA	94062
Karen	Sanders	Sonoma	CA	95476
Boris	Yatovitz	Mountain Vie	CA	94041
Kathy	Hutton	Livermore	CA	94550
Tad & Christir	Sullivan	Corona Del M	CA	92625
Rebecca	Kiperts	San Diego	CA	92123
Matthew	Conti	Sacramento	CA	95819
Karen	Guma	Petaluma	CA	94952
William	Webster	Oroville	CA	95966
Roger	Jennings	San Diego	CA	92110
Susan	Guild	Sherman Oak	CA	91411
Adam	Trauger	Long Beach	CA	90815
Cheryl	Rockwell	Santa Cruz	CA	95060
Paula	Duker	San Francisc	CA	94132
Sharon	Niederhaus	Portola Valley	CA	94028
Britt	Lind	Thousand Oal	CA	91360
Heather	Mchugh	Oakland	CA	94611
Marguerite	Sgrillo	Richmond	CA	94806
Teresa	Winsor	San Diego	CA	92104
Gina	Gianfala	Pebble Beach	CA	93953
Pam	Domecq	Sacramento	CA	95831

Judith	Bayer	San Diego	CA	92126
Juliet	Johns	Grass Valley	CA	95949
Carla	De Mos	San Diego	CA	92121
Faith	King	San Jose	CA	95117
Stacy	Willis	Arroyo Grand	CA	93420
J W	Oman	Oakland	CA	94611
Emma	Javaherian	La Mesa	CA	91941
A. Christophe	Urbach	Chico	CA	95928
Fujiko	Yamashita	Marina Del Re	CA	90292
Erika	Moreno	Whittier	CA	90604
Valerie	Phillips	Citrus Heights	CA	95611
Carol	Henning	Chico	CA	95926
Mitch	Cohen	Berkeley	CA	94709
Ulrike	Mehler	Culver City	CA	90230
Jan	Stark	Westminster	CA	92683
Eve	Angle	La Mesa	CA	91941
Jo	Forkish	Sunnyvale	CA	94087
Sharon	Byers	Downey	CA	90242
Rich & Cynthia	Royce-Kasbo	San Diego	CA	92104
Sadie	Sullivan-Greir	El Cajon	CA	92020
Sylvia	Lombera	Fresno	CA	93702
Taochiung	Chi	Fremont	CA	94539
Alan	Grantham	Rancho Cucar	CA	91701
John	Holtzclaw	San Francisco	CA	94133
Marybeth	Arago	Fort Bragg	CA	95437
Donald	Taylor	Fair Oaks	CA	95628
Jacki	Hileman	Hesperia	CA	92345
Shan	Crockett	Aptos	CA	95003
Donald	Erway	South Pasade	CA	91030
Sanford	Higginbotham	Malibu	CA	90265
Keith	York	Ventura	CA	93003
Betsy	Wood	Sunnyvale	CA	94087
Spring	Gardiner	Sherman Oak	CA	91423
James	Gill	Altadena	CA	91001
Michael	Walsh	San Francisco	CA	94118
donald	erway	South Pasade	CA	91030
Jessica	Reese	Rancho Cucar	CA	91730
Jessie	Root	Vista	CA	92084
Charles	Turner	Chatsworth	CA	91311
Linda	Rubin	Jamul	CA	91935
Teresa	Montanelli	Alameda	CA	94502
Mary Lou	Knapp	Camptonville	CA	95922
Charesa	Harper	Glen Ellen	CA	95442
Ryan	Schrader	Cerritos	CA	90703
Sean	Corrigan	Bellflower	CA	90706
Richard & Car	Rosenstein	Los Angeles	CA	90067
Wendy	Rosenfeld	North Hollywo	CA	91601
Catherine	Regan	San Francisco	CA	94116
Darlene	Oolie	Spring Valley	CA	91977
Michelle	Oroz	Morgan Hill	CA	95037
Michael	Mills	San Francisco	CA	94115
Merna	Strassner	Oakland	CA	94610
Colleen	Chiang	San Jose	CA	95116
Gary	Simmons	Murrieta	CA	92562
Joie	Winnick	Sherman Oak	CA	91423
Pamela	Langley	Murrieta	CA	92562
shiela	cockshott	Belmont	CA	94002
Eileen	Robinson	Orange	CA	92868
Diana	Dee	North Hollywo	CA	91606

Teri	Snow	Chico	CA	95926
Rona	Mackay	Tehachapi	CA	93561
Diane	Hoffman	Fairfax	CA	94930
Dorothy	Schumacher	Walnut Creek	CA	94595
Belinda	Allen	Gilroy	CA	95020
Richard	Wightman	Arcadia	CA	91006
Misty	Mcintyre	Alameda	CA	94501
Christopher	Barnickel	San Luis Obis	CA	93405
Nancy	Polito	Orangevale	CA	95662
Rita	Carlson	Eureka	CA	95502
Allen	Freihofer	Sacramento	CA	95812
Michael	Hale	Fremont	CA	94536
Sydney	Zentall	Santa Cruz	CA	95060
Joanne	Jacobs	San Francisc	CA	94124
Jim	Brown	Los Angeles	CA	90034
Ruth	Burman	San Carlos	CA	94070
Tommy	Bacorn	Los Angeles	CA	90016
Douglas	Dyakon	Los Angeles	CA	90069
Theodore	Milkoff	Santa Rosa	CA	95404
Maris	Bennett	Antioch	CA	94509
Rayna	Eyster	Eureka	CA	95503
Jo	Benn	San Jose	CA	95112
Carly	Hollas	Los Angeles	CA	90036
Janet	Flanagan	Platina	CA	96076
Vincent	Bilbro	Highland Park	CA	90042
Matthew	John	Marina Del Re	CA	90292
Barry	Kaufman	Burbank	CA	91506
Rob	Shaw	Ridgecrest	CA	93555
Donald	Alter	Oakland	CA	94611
Ballinger	Kemp	Richmond	CA	94804
Mike	Culhane	Studio City	CA	91604
Lorrie	Stillings	Sebastopol	CA	95472
Dan	Maslana	Pleasanton	CA	94588
Robert	Glover	Fresno	CA	93726
Lenores	Sheridan	Berkeley	CA	94703
Charles	Wieland	San Ramon	CA	94583
Terry	Hawkins	San Francisc	CA	94109
Joy	Baker	San Francisc	CA	94121
Craig	Brestrup	Gualala	CA	95445
Deborah	Zwerner	San Francisc	CA	94112
Anne	Gross	Modesto	CA	95351
Sandra	Gamble	Ridgecrest	CA	93555
Amy	Zink	Oakland	CA	94606
Elena	Ennouri	Redwood Cit	CA	94061
Nancy	Black	Santa Barbar	CA	93105
Dan	Kittredge	La Mesa	CA	91941
Rod	Rochambeau	Arcata	CA	95521
Amy	Flores	Pasadena	CA	91101
Sharon	Nicodemus	Sacramento	CA	95821
Angela	Hoyes	Alta Loma	CA	91737
Sally	Ross	San Francisc	CA	94131
Irene	Kang	Los Angeles	CA	90066
James	Gibson	Los Angeles	CA	90034
Frank	Hill	North Hollyw	CA	91601
Corinne	London	Santa Clara	CA	95050
Pamela	Horowitz	San Francisc	CA	94118
Lillian	Paynter	Oxnard	CA	93035
Irish	Rodriguez	Calxico	CA	92231
Michael And F	Britton	Rancho Cord	CA	95670

Katherine	Wright	Aliso Viejo	CA	92656
Katie	Yu	Ladera Ranch	CA	92694
Roger	Seapy	Los Alamitos	CA	90720
Arvind	Ravikumar	Campbell	CA	95011
Bruce	Wallace	Vista	CA	92084
Dominic	McNaughton	Concord	CA	94519
Marilyn	Rietzel	North Hollywood	CA	91601
Dan	Matthews	Valley Center	CA	92082
Patrick & Dan	Thompson	Los Gatos	CA	95032
Arvind	Ravikumar	Campbell	CA	95011
Barbara	Clarke	Chico	CA	95928
Don	Hayler	San Francisco	CA	94122
Dustin	Crook	Fountain Valley	CA	92708
Eileen	Boken	San Francisco	CA	94116
Gordon	Cook	Rough and Ready	CA	95975
Steven	Taylor	Berry Creek	CA	95916
Ruth	Oroshnik	Sherman Oak	CA	91403
Suzanne	Hodges	Rancho Cordoba	CA	95670
Martha	Graham-Walton	Felton	CA	95018
Marrisha	Abbot	Boulder Creek	CA	95006
Benita	Peters	Vista	CA	92081
Carol	Whitehurst	McKinleyville	CA	95519
Walter	Huitema	Whittier	CA	90604
Cassandra	Collins	San Diego	CA	92116
Gerald	Mckelvey	Manteca	CA	95336
T	N	Vallejo	CA	90303
Sophie	Dupart	San Jose	CA	95128
Sally	Symanski	San Diego	CA	92107
Christine	Stewart	Escondido	CA	92026
Isabel	Molloy	San Francisco	CA	94121
Michele	Pagel	Berkeley	CA	94707
Kurt	Fillmore	Petaluma	CA	94954
Mariela	Haro Rodriguez	Reseda	CA	91335
Lucinda	Lenicheck	Palo Alto	CA	94306
Paul	Burks	San Rafael	CA	94903
Deborah	St. Julien	San Jose	CA	95136
Alan	Condell	Fremont	CA	94538
Richard	Luczynski	Pasadena	CA	91104
Kathleen	Bungarz	Walnut Creek	CA	94598
Tasha	Boucher	Sherman Oak	CA	91403
Jerry	McComb	Long Beach	CA	90814
Kenneth	Wilcox	Sacramento	CA	95811
Thomas	Rossi	Sun Valley	CA	91352
Eduardo	Abarca	San Francisco	CA	94112
Rosalind	Bresnahan	San Bernardino	CA	92405
Alison	Cardinet	El Cerrito	CA	94530
Sherry	Handy	Lincoln	CA	95648
Stephanie	de los Rios	Del Mar	CA	92014
Richard	Engle	Winnetka	CA	91306
Dan	P. Hampshire	Dan	CA	94107
Lisa	Paynemiller	Irvine	CA	92620
Sharman	Saffier Willis	Stockton	CA	95207
Joseph	Pluta	Bakersfield	CA	93301
William	Lawrence	Duarte	CA	91010
William	Lawrence	Duarte	CA	91010
William	Lawrence	Duarte	CA	91010
James	Diaz	San Jose	CA	95124
Tera	Blackman	Carlsbad	CA	92008
Jennifer	Toth	Santa Clarita	CA	91350

Stephanie	Johnson	Los Angeles	CA	90078
Karen	Krulevitch	Santa Barbara	CA	93111
David	Griffith	Rancho Cucamonga	CA	91737
G	Caviglia	Morgan Hill	CA	95038
Suzanne	Komili	San Francisco	CA	94110
Karen	Stewart	San Jose	CA	95120
Brigitte	Greener	San Jose	CA	95125
Michael	Sandler	Los Angeles	CA	90025
Marianne	Shaw	San Rafael	CA	94903
Roberta	Newman	Mill Valley	CA	94941
Alan	Nahum	La Jolla	CA	92037
Yazmin	Gonzalez	Bellflower	CA	90706
Curtis	Moore	San Francisco	CA	94110
R	Bridges	Alta Loma	CA	91737
Margaret	Wessels	Aptos	CA	95003
Sharman	Kobayashi	Yuba City	CA	95993
Nancy	Hiestand	Davis	CA	95616
Joe	Yuhas	San Diego	CA	92116
Michael	Keene	Nevada City	CA	95959
Dennis	Dougherty	San Rafael	CA	94903
David	Michalik	Seal Beach	CA	90740
G	Hauser	Pasadena	CA	91103
Lara	Ingraham	Los Angeles	CA	90038
Michael	Toobert	Grass Valley	CA	95945
Erin	Stuart-Jennin	San Francisco	CA	94112
Kimberly	Phillips	Santa Ana	CA	92706
Soraya	Dosaj	Van Nuys	CA	91401
Lonnie	Sheinart	Los Angeles	CA	90064
Kim	Harvey	Palo Alto	CA	94301
Ryan	Grimm	Pacifica	CA	94044
Glenn	Embrey	Redondo Beach	CA	90278
Rob	Gallinger	Los Angeles	CA	90042
Ted	Michel	Oakland	CA	94608
Donna	Erie	El Segundo	CA	90245
Andrea	Torres	North Hills	CA	91343
Michael	Bordenave	Fresno	CA	93728
Leslie	Mercer	Sonoma	CA	95476
Susan	McLaughlin	Foothill Ranch	CA	92610
Mary	Doane	Freedom	CA	95019
Sarah	Kass	Mill Valley	CA	94941
Flo	Kelly	San Francisco	CA	94110
Mike	Rabe	Chatsworth	CA	91311
David	Adalian	Visalia	CA	93277
David	Adalian	Visalia	CA	93277
Loren	Jones	Berkeley	CA	94704
Bruce	Raymond	Oceanside	CA	92054
Adela	Valdez	San Diego	CA	92115
Dominick	Guillemot	Malibu	CA	90265
Uriel	Aguilar	Mountain View	CA	94040
Jane	Crist	Pacific Palisades	CA	90272
Simone	Pisias	Mendocino	CA	95460
Kathleen	Seisdedos	Windsor	CA	95492
Lin	Penrose	Atascadero	CA	93422
Sara	Fung	Santa Rosa	CA	95405
Judy	Carter	Santa Rosa	CA	95403
Tom	Burt	Santa Barbara	CA	93110
Brian And Diana	Moss	San Jose	CA	95125
Jerry	Oliver	Sylmar	CA	91342
Bob	Johnson	Aptos	CA	95003

Linda	Malone	Ukiah	CA	95482
Deborah	Kearns	San Francisc	CA	94121
Roger	Vaught	Redwood City	CA	94061
Shirley	Henderson	Huntington B	CA	92646
Mary	Tooker	Aptos	CA	95001
David	Foulger	Apple Valley	CA	92307
Grant	Smith	Thousand Oal	CA	91360
Susanne	Wood	Santa Barbar	CA	93101
Regina	Garrison	Imperial Beac	CA	91932
Anita	Frost	Castaic	CA	91384
Cheryl	Catron	Sunnyvale	CA	94085
Muiz	Brinkerhoff	Santa Rosa	CA	95403
Isla	Kegler	San Pedro	CA	90731
Sophia	Savich	Gualala	CA	95445
Rose	Henderson	Los Angeles	CA	90044
George	Jackson	Santa Rosa	CA	95404
Albert	Marangoni	Newbury Park	CA	91320
David	Hyde	Orick	CA	95555
Teresa	Yrastorza	Berkeley	CA	94702
Jim	Compton-Sch	Reedley	CA	93654
Sergio	Jorge	Santa Rosa	CA	95403
Lindsay	Benjamin Brit	Olympic Valle	CA	96146
Maryanne	Murphy	Los Gatos	CA	95033
Jerry	Chagala	Poway	CA	92064
Ronald	Granberg	North Hills	CA	91343
Dean	Kobayashi	Sunnyvale	CA	94089
Robert	Jump	Ukiah	CA	95482
Peter	Collins	Saint Helena	CA	94574
Caren	Hanson	Sun City	CA	92585
Helen	Turin	Glendale	CA	91206
David	Whetstone	Oakland	CA	94610
John	Caredio	San Jose	CA	95112
Carolyn	De Mirjian	Valley Glen	CA	91401
Thierry	Tondusson	San Rafael	CA	94915
Geoffrey	Stradling	Encino	CA	91316
Richard	Loftus	Rancho Mirag	CA	92270
Karen	Young	San Francisc	CA	94118
Alethea	Ludowitz	Woodland Hill	CA	91364
Ingrid	Newstadt	Los Angeles	CA	90065
Melissa	Atkinson	Los Angeles	CA	90064
Lori	Ayre	Petaluma	CA	94952
Laura	Parks	Bonny Doon	CA	95060
Zvika	Greensfeilds	San Rafael	CA	94903
Jennifer	Sampou	Orinda	CA	94563
Ernest	Canning	Thousand Oal	CA	91362
Felipe	Mora	Goleta	CA	93117
Judith	Falck-Madsen	Carpinteria	CA	93013
J.L.	Angell	Rescue	CA	95672
Anita	Martel	Chula Vista	CA	91910
Brenda	Christenesn	Woodside	CA	94062
Barry	Wallace	Highland	CA	92346
Elsa	Gerard	Manhattan Be	CA	90266
James	Bennett	Sherman Oak	CA	91411
Daniel	Lichtenhan	Oceanside	CA	92057
Brenda	Koenig	Escondido	CA	92027
Roberta	Thompson	Sun Valley	CA	91352
Kathryn	MacBride	Orinda	CA	94563
Anne-Catheri	Roch Levecq	Oceanside	CA	92056
Inga	Olson	San Diego	CA	92117

Karen	Riggs	Keeler	CA	93530
Eric	Wells	San Francisco	CA	94134
Eric	Haas	San Mateo	CA	94402
Gita	Dvorak	Berkeley	CA	94703
Belinda	David	Irvine	CA	92614
Terri	Levine	Santa Cruz	CA	95062
John	Deland	Carlsbad	CA	92009
Cindy	Ferguson	Sacramento	CA	95827
Audrey	Armstrong	Los Gatos	CA	95033
Setal	Patel	Dana Point	CA	92629
Jan	Hansen	Somerset	CA	95684
Kathleen	Wheater	San Francisco	CA	94107
Sue-Anne	Ellis	Cathedral City	CA	92234
Michelle Ann	Lyman	Petaluma	CA	94952
Kristy	Powers-Stacy	Bakersfield	CA	93312
Martha	Diaz	Redondo Beach	CA	90277
Dar	Bertsch	Santa Cruz	CA	95062
Meggi	Raeder	Palo Alto	CA	94301
Paula	Chadbourn	Valencia	CA	91355
Robert	Norton	La Mesa	CA	91943
Tim	Cutter	National City	CA	91950
Fritz	Pinckney	Napa	CA	94558
Helen	Patek	Oakland	CA	94619
Renee	Wing	Concord	CA	94521
Gretchen	Stipek	Manhattan Beach	CA	90266
Eric	Nilsson	Chico	CA	95926
Ananda	Patterson	Rodeo	CA	94572
Theresa	Vernon	Santa Rosa	CA	95404
Sandra	Cutuli	Los Angeles	CA	90035
Sean	Corrigan	Bellflower	CA	90706
Joseph	Porterfield	Carmichael	CA	95608
Deborah	Miller	Santa Barbara	CA	93150
Linda	Eberle	Venice	CA	90291
Dorothy	Mitchell	Chico	CA	95926
Kent	Williams	Glendora	CA	91741
Chantal	Van Schooten	Sunnyvale	CA	94087
Pam	Welsh-Durbin	Yucaipa	CA	92399
Charity	Kenyon	Galt	CA	95632
Jacque	Duerr	Sacramento	CA	95831
Ron	Mcgill	Los Angeles	CA	90039
Kathy	Conway	Davis	CA	95618
Kate	Barnes	Solana Beach	CA	92075
Donna	Harris	Signal Hill	CA	90755
Camilla	Field	San Francisco	CA	94115
Dennis	Pocakay	Petaluma	CA	94952
P	Cook	Ventura	CA	93001
John	Cordes	Sunnyvale	CA	94085
Jessica	Kelmon	Walnut Creek	CA	94597
Drew	Irby	Mission Viejo	CA	92691
Adaya	Walsh	Ojai	CA	93023
Monica	Rosoff	Half Moon Bay	CA	94019
Judith	May	San Francisco	CA	94122
Jean	Hepner	Redwood City	CA	94062
Ralph	Hipps	San Jose	CA	95117
Benjamin	Rodriguez	Hercules	CA	94547
Longwilow	Fudenberg	Occidental	CA	95465
John	Herziger	Sierra Madre	CA	91024
Charles	Almack	Calexico	CA	92231
Cathy	Mullins	Laguna Beach	CA	92651

Laura	Tryon	Big Sur	CA	93920
Mary	Noe	San Jose	CA	95112
Shoshana	Simon	Yucaipa	CA	92399
Michael	Szeto	San Marino	CA	91108
Alan	Carlton	Alameda	CA	94501
Steven	Ganter	Santa Barbar	CA	93101
Marc	Vezian	San Jose	CA	95132
Elisabeth	Orr	Long Beach	CA	90807
Jody	Snyder	Ben Lomond	CA	95005
LD	Anderson	Felton	CA	95018
Ann Marie	Morris	Rancho Palos	CA	90275
Ann Marie	Morris	Rancho Palos	CA	90275
pinkyjain	pan	Santa Rosa	CA	95403
John	Danner	Sacramento	CA	95819
Donna	Crane	Anderson	CA	96007
Liana	Beckett	La Mesa	CA	91942
Kathleen	Mculty	Alameda	CA	94501
Elisabeth	Armendarez	Santa Ana	CA	92703
Clara	Levy	Los Angeles	CA	90048
Rhona	Ory	Walnut Creek	CA	94597
Steve	Clifford	Rcho Sta Mar	CA	92688
Jackie	Mucha	Richmond	CA	94804
Kathleen	Shores	Grass Valley	CA	95945
Rebecca	Wang	Alhambra	CA	91801
Phyllis	Lyons	Studio City	CA	91604
Scott	Jenkins	San Luis Obis	CA	93406
Lee	Miller	Placerville	CA	95667
Belinda	Higuera	Mount Shasta	CA	96067
Jeanette	King	Livermore	CA	94550
Naomi	Mindelzun	Palo Alto	CA	94303
Ian	Beavis	Long Beach	CA	90803
Carol	Plantamura	San Diego	CA	92121
Brenda	Bell	Monterey	CA	93940
Robert	Markovic	Los Angeles	CA	90004
Allison	Navarro	San Juan Bau	CA	95045
Karsson	Hevia	San Rafael	CA	94903
Marcus	Zimmerman	Sherman Oak	CA	91423
Kathryn	Alexander	Sacramento	CA	95833
Laila	Sabet	Davis	CA	95616
Kevin	Kerslake	Venice	CA	90291
Carolyn	Rice	Oakland	CA	94609
Stan	Souza	Santa Rosa	CA	95409
Katherine	Johnson	Santa Barbar	CA	93110
Janice	Eddy	Pacifica	CA	94044
Will	Pallister	Oakland	CA	94612
Horst	Leuschner	Jamul	CA	91935
Debbie	Sousa	Antioch	CA	94509
Richard	Reynolds	Malibu	CA	90265
Susan	Goodman	Santa Monica	CA	90404
Pat	Smith	Orinda	CA	94563
Kyle	Halkola	Los Altos	CA	94022
Loretta	Flores	Topanga	CA	90290
Gail	Curtis	Huntington B	CA	92646
Tsipora	Peskin	Berkeley	CA	94707
Carol	Lillis	Albion	CA	95410
Carol	Warren	Dixon	CA	95620
Bruce	Mews	San Jose	CA	95123
Robert & Deic	Kramer	Mariposa	CA	95338
Javier	Saldena	Oakland	CA	94618

Kay	Schaser	Eureka	CA	95501
Julia	Martin	Woodacre	CA	94973
Kathleen	Herring	La Quinta	CA	92253
Anthony	Craig	Vacaville	CA	95688
Bob	Waller	San Diego	CA	92126
Carol	Wolfe	Santa Rosa	CA	95405
Kathleen	Boyer	Rancho Santa	CA	92688
Kathleen	Boyer	Rancho Santa	CA	92688
David	Fulps	Alhambra	CA	91801
Bruce	Montgomery	Carlsbad	CA	92011
Melodie	White	Walnut Creek	CA	94595
Rebecca	August	Buellton	CA	93427
Craig	Schmidt	Atascadero	CA	93422
Robert	Sublett	San Jose	CA	95125
Carl	Grant	Concord	CA	94519
Shiva	Berman	Lafayette	CA	94549
Christian	Hoffman	La Crescenta	CA	91214
Amy	Conger	Livermore	CA	94551
Richard	Kilfoyle	Davis	CA	95616
Elizabeth	Franklin	Sacramento	CA	95829
Rosie	Bachand	Stockton	CA	95219
Amy	Cayton	Watsonville	CA	95076
Gayl	Hunter	Los Angeles	CA	90036
Kate Meredith	Flather	Santa Monica	CA	90405
Alice E.	Goldstein	Venice	CA	90291
David	Kunhardt	Corte Madera	CA	94925
Anoop	Sharma	Chino Hills	CA	91709
Warren	Gold	Mill Valley	CA	94941
Jennie	Brawner	San Marcos	CA	92078
Amy	Stinstrom	Irvine	CA	92602
Jennifer	Valenti	San Diego	CA	92111
Gary	Beckerman	Santa Ynez	CA	93460
M	Pramik	San Francisco	CA	94115
Harley	Sebastian Lev	Sacramento	CA	95823
Dylan	Chapple	Oakland	CA	94611
SI	Silveira	Sacramento	CA	95829
Paul	Portch	San Ramon	CA	94583
Jennifer	Hollander	La Mesa	CA	91941
Katrina	Volgamore	Pittsburg	CA	94565
Juliann	Berman	Redwood City	CA	94061
Julie	Aronson	Santa Rosa	CA	95409
Win	Landureth	Carpinteria	CA	93013
Thomas	Ressler	Redondo Beach	CA	90277
Elizabeth	Brunner	San Francisco	CA	94117
Katherine	Keough	Redding	CA	96001
Barry	Saltzman	Los Angeles	CA	90035
Bev	Kelly	Long Beach	CA	90803
David & Ada	Dorn	Livermore	CA	94551
Robert	Hanson	Walnut Creek	CA	94595
Gloria	Naisbitt	Santa Rosa	CA	95404
Stephen	Kay	Occidental	CA	95465
Brian	Debasitis	San Jose	CA	95123
Heike	Behl	San Diego	CA	92109
Paulette	Tansey	San Diego	CA	92110
Marylee	Bradley	Turlock	CA	95382
Martha	Rabkin	Berkeley	CA	94708
Jared	Mabie	Palm Springs	CA	92264
Robert	Mcnamara	Culver City	CA	90230
Jim	Singer	Rocklin	CA	95677

Emily	Felt	Los Angeles	CA	90027
Kelly	Bowen	San Diego	CA	92116
Joseph	Fleming	Daly City	CA	94014
Sue	Struthers	Riverside	CA	92506
Heiko	Mauermann	Hemet	CA	92545
David	Salahi	Laguna Niguel	CA	92677
Candace	Hyde-Wang	Berkeley	CA	94708
Helane	Wahbeh	Petaluma	CA	94954
George	Loeb	Three Rivers	CA	93271
Gaye	O'Callahan	Goleta	CA	93117
Joan	Barrymore	Shingletown	CA	96088
Eric	Pickering	Roseville	CA	95661
Mary	Gill	Stanford	CA	94305
Chris	Dier	San Jose	CA	95125
Ann	Myers	Berkeley	CA	94705
Richard	Sachen	Petaluma	CA	94954
Maureen	Happer	San Diego	CA	92109
Robert	Aston	San Francisco	CA	94118
Chris	Schwedes	Thousand Oaks	CA	91360
Marla	Wyatt	Yucaipa	CA	92399
Stacia	Linde	Rescue	CA	95672
Connie	Lyons	Saratoga	CA	95070
Shellie	Krick	Pleasant Hill	CA	94523
Anny	Wiedemann	Westlake Village	CA	91362
Pam	Slaterprice	Del Mar	CA	92014
Laura	Salanitro	Fullerton	CA	92832
Lee	Staley	Scotts Valley	CA	95066
Tiger	Cosmos	Corona	CA	92883
Peter	Weissman	Whitethorn	CA	95589
Ray	Bustos	Fullerton	CA	92832
Charles	Harris	San Rafael	CA	94903
Ed	Edinger	Woodland Hills	CA	91367
Marlana	Donehoo	San Francisco	CA	94107
Elizabeth	Trudell	Los Altos	CA	94024
Lynne	Anderson	North Hollywood	CA	91606
Jim	Patton	Los Altos	CA	94024
Susie	Foot	Mckinleyville	CA	95519
Karen	Humphreys	Marina Del Rey	CA	90292
Mildred	Bean	Newport Beach	CA	92663
Patricia	Kinney	Palo Alto	CA	94303
Laura	Zakarin	Dana Point	CA	92629
D	Rowe	Santa Monica	CA	90403
Michele	Mckinley	Los Angeles	CA	90041
Elizabeth	Watts	Richmond	CA	94804
Mark	Van Valkenburgh	Berkeley	CA	94703
Gregory	Doty	Rancho Palos Verdes	CA	90275
Mindy	Davison	Fair Oaks	CA	95628
Sharon	Wright	Huntington Beach	CA	92649
David	Wasserman	Berkeley	CA	94707
Leila	Zaharopoulos	West Hills	CA	91304
Bruce	Rose	Alameda	CA	94501
Sharon	Giglio	Sebastopol	CA	95472
Esther	Koh	Aliso Viejo	CA	92656
Lauren	Reilly	Artesia	CA	90701
Linda	Maher	Newport Beach	CA	92658
Melissa	Brick	Vacaville	CA	95688
Todd	Mayer	Soquel	CA	95073
Linda	Remy	Mill Valley	CA	94941
Ron & Carol	Hoops	Carmichael	CA	95608

Karen	Wilson	Sacramento	CA	95838
Julie	Higgins	Mendocino	CA	95460
Betty Jo	Meshnik	Encinitas	CA	92024
Christopher	Rebert	Hillsborough	CA	94010
Sandra	Mccanne	San Juan Cap	CA	92675
Kristen	Conner	San Pablo	CA	94806
Jim	Neary	Santa Rosa	CA	95405
Tom	Kunhardt	Oakland	CA	94602
Elizabeth	Kutska	Glen Ellen	CA	95442
Kim	Stevens	Richmond	CA	94804
Nancy	Huber	Palo Alto	CA	94301
Jenny	Melara	San Francisc	CA	94124
Vivian	Deutsch	Calabasas	CA	91302
Eileen	Fagan	Valley Center	CA	92082
Ann	Van Sant	Irvine	CA	92617
Alejandro	De Avila	Menlo Park	CA	94025
Cathie	Labrecque	Cerritos	CA	90703
Diana	Nichols	Carmel	CA	93923
Dan	Silver	Los Angeles	CA	90012
Noelle	Prince	San Diego	CA	92111
Paul	Martin	San Francisc	CA	94111
Toni	Bird	Flintridge	CA	91011
Miguel	Esqueda	La Puente	CA	91744
Don & Marian	Callahan	El Cajon	CA	92020
Bill	Lindner	Greenbrae	CA	94904
Jessica	Dietrich	San Diego	CA	92131
Alan	Goggins	Castro Valley	CA	94546
Sigal	Tzoore	Portola Valley	CA	94028
Richard	White	Oceanside	CA	92057
Autumn	Gonzalez	El Dorado	CA	95623
John	Gould	Oakland	CA	94612
Nerina Laken	Wallace	Oakland	CA	94610
Rosaanna	Defilippis	San Francisc	CA	94122
Franklin	Knight	San Francisc	CA	94110
Monica	Barber	Los Angeles	CA	90045
Susan	Mackenzie	Kentfield	CA	94904
Carol	Reynes	Venice	CA	90291
Tina	Loayza	Pismo Beach	CA	93449
Douglas	Litten	Woodland Hill	CA	91364
Rollin	Odell	Orinda	CA	94563
John	Crump	San Jose	CA	95128
Wendy	Minovitz	Northridge	CA	91326
Steve	Roth	Santa Rosa	CA	95409
Jacob	Dietzman	Los Angeles	CA	90012
Patricia	Rhoda	Santa Rosa	CA	95403
Lila	Taylor	Ventura	CA	93001
Vera	Moorer	Chula Vista	CA	91915
Heather	Bakke	Oakland	CA	94608
Rita	Fahrner	San Francisc	CA	94110
Bruce	Daniels	Capitola	CA	95010
Gh	Soto	San Diego	CA	92117
Rebecca	Newman	Irvine	CA	92612
Daniel	Maslana	Pleasanton	CA	94588
Gerald	Telep	Rncho Cordov	CA	95742
Irving	Shapiro	Cypress	CA	90630
Nancy	Bast	Morro Bay	CA	93442
Debra	Knowles	Sonoma	CA	95476
Jud	Woodard	Sutter Creek	CA	95685
Wilson	Sauthoff	Santa Cruz	CA	95060

Ethel	Ruymaker	Oakland	CA	94618
Anne	Muraski	Monterey	CA	93940
Lisa	Kearney	Petaluma	CA	94954
Clary	Neil	West Covina	CA	91790
Juliette	Lett	Los Angeles	CA	90001
Richard	Rhoda	Santa Rosa	CA	95403
Mayumi	Knox	San Marino	CA	91108
Tami	Bullock	San Diego	CA	92122
K	Valentine	Carson	CA	90745
Christy	Marx	San Mateo	CA	94402
Monica	Koehler	Sacramento	CA	95831
Georgianna	Knopf	San Luis Obis	CA	93405
Barbara	Lindemann	Santa Barbar	CA	93105
Dene	Larson	San Francisc	CA	94117
Liz	Chamberlain	Roseville	CA	95678
Phillip	Leonard	San Francisc	CA	94112
Amanda	Lovejoy	Los Angeles	CA	90068
Beth	Wilcoxon	Fair Oaks	CA	95628
Michele	Demoulin	Aptos	CA	95001
Diane	Reed	Richmond	CA	94804
Gordon	Ivens	Los Angeles	CA	90042
Marc	Hamilton	Moss Beach	CA	94038
Laura	Little	Grass Valley	CA	95945
Henry	Sanchez	Ojai	CA	93023
Betty	Waverly	Newport Beac	CA	92660
Tracy	McPherson	Jacumba	CA	91934
John	Johnston	Napa	CA	94558
Amy	Hile	Oak Park	CA	91377
Rochelle	La Frinere	San Diego	CA	92114
Rochelle	La Frinere	San Diego	CA	92114
Leslie	Simon	Woodland Hill	CA	91364
Valorie	Walker	Fullerton	CA	92832
Derk	Brewster	Pasadena	CA	91104
Scott	Nelson	Bethel Island	CA	94511
Larry	Steen	Los Angeles	CA	90035
Edmund	Jones	Anaheim	CA	92804
Maureen	Mcgee	Pacific Palisac	CA	90272
Carol	Lumsden	Upland	CA	91784
Lloyd	Niven	Studio City	CA	91604
Kelly Lynn	Anderson	Dunsmuir	CA	96025
Eva	Leeman	Vista	CA	92083
Gordon	Thornburg	Bishop	CA	93514
Scott	Emsley	Carmel	CA	93923
Liz	Stromath	Manhattan Be	CA	90266
Platt	Katherine	Laguna Wood	CA	92637
Nathaniel-mic	Dunn	Brea	CA	92821
Laurel	Emsley	Carmel	CA	93923
Sydney	Berner	Covina	CA	91722
Miriam	Stickler	San Francisc	CA	94116
Jennifer	Parks	Boulder Cree	CA	95006
Christopher	Aycock	San Francisc	CA	94116
Nancy	Oliver	Los Angeles	CA	90039
Fjaere	Mooney	North Hollyw	CA	91606
Shane	Hunner	Portola Valley	CA	94028
Sally	Crawford	Los Angeles	CA	90036
Mark	Poland	Palmdale	CA	93550
Philippa	Alvis	Monte Serenc	CA	95030
Philippa	Alvis	Monte Serenc	CA	95030
Jim	MacDonald	Culver City	CA	90230

Richard B	Maselow, CPA	Encino	CA	91316
Mark	Knowles	Los Angeles	CA	90027
Olga	Sazonova	Stanford	CA	94305
Mary	Davison	Sebastopol	CA	95472
Paul	Chock	Redwood City	CA	94062
Suzy	Karasik	Pinole	CA	94564
Thomas	Brady	Pilot Hill	CA	95664
Lynette	Ridder	Concord	CA	94521
Christopher	Pincetich	Point Reyes S	CA	94956
Marcus	Niehaus	Los Angeles	CA	90042
Scott	Maretti	Oakland	CA	94611
Victor	Dimascio	Hollister	CA	95023
Jane	Allingham	Joshua Tree	CA	92252
Robert	Stout	Fairfax	CA	94930
Stein	Petersen	San Francisc	CA	94114
Victoria	Wright	Ramona	CA	92065
Susan	Wade	Morgan Hill	CA	95037
Sheila	Grimes	Torrance	CA	90505
Keith	Wheldon	Sierra Madre	CA	91024
Donna	Kowzan	Moorpark	CA	93021
Sally	Paris	Walnut Creek	CA	94596
George	Dedekian	Oakland	CA	94605
Fereshteh	Valamanesh	Belmont	CA	94002
Vince	Elliott	San Bruno	CA	94066
Elizabeth	Lawler	Chico	CA	95926
Kiana	Rose	Sebastopol	CA	95473
Lydia	Yasuda	Diamond Bar	CA	91765
Elaine	Mont-Eton	San Rafael	CA	94901
Christine	Salido	South Lake T	CA	96150
Teresa & Willi	Weaver	Novato	CA	94947
Jill	Davine	Culver City	CA	90232
Walter	Bankovitch	Berkeley	CA	94703
Sheila	Desmond	Cameron Par	CA	95682
Rajan	Dosaj	Van Nuys	CA	91401
June	Yamada	Westminster	CA	92683
Ann	Nitzan	Palo Alto	CA	94301
Brian	Cole	Hayward	CA	94540
Jane	Woehl	Sacramento	CA	95815
Peter	Gjerset	Los Angeles	CA	90038
Alexander	Schindler	Oakland	CA	94605
Brenda	Dearborn	Port Hueneme	CA	93041
Janice	Lukas	San Francisc	CA	94132
John	Gilbert	San Jose	CA	95126
Erik	Svehaug	Santa Cruz	CA	95062
Sharon	Verani	Altadena	CA	91001
Robert	Sorensen	Merced	CA	95341
Ann	Thompson	Crescent City	CA	95531
Amy	Wilson	San Mateo	CA	94401
Chanda	Scelsi	Trabuco Cany	CA	92678
Scott	Opis	San Diego	CA	92103
Portland	Coates	Berkeley	CA	94704
Jon	Berg	Walnut Creek	CA	94596
Cindy	Abbott	Pacifica	CA	94044
Laurie	Litman	Sacramento	CA	95816
Cindy	Abbott	Pacifica	CA	94044
Tom And Kate	Runyan	Santa Monica	CA	90404
Darryl	Roberts	Petaluma	CA	94954
Garret	Carstensen	San Francisc	CA	94117
Carol	Vallejo	Stockton	CA	95209

Margaret	Murray	Pinole	CA	94564
Theodore	Finkler	Nevada City	CA	95959
Christel	Cranston	Anderson	CA	96007
Tia	Triplett	Los Angeles	CA	90066
Sarah	Townsend	Sunnyvale	CA	94086
Jacqueline	Mahrley	Fullerton	CA	92832
Mike	Swanson	Panorama Cit	CA	91402
Daniel	Stevenson	Poway	CA	92064
John	Peck	Santa Cruz	CA	95060
Pamela	Reaves	San Rafael	CA	94903
Bill	Leikam	Palo Alto	CA	94306
Jean	Aiken	Sunnyvale	CA	94087
Brenda	Calloway	Murrieta	CA	92563
Jessie	Cauch	Rocklin	CA	95765
Ken	Currie	Winnetka	CA	91306
Nan	Singh-Bowma	Ben Lomond	CA	95005
Paula	Carrier	San Diego	CA	92101
John	Bidwell	Berkeley	CA	94702
Fernando	Castrillon	Albany	CA	94706
Garry	Star	Thousand Oal	CA	91362
Shirani	Perera	Anaheim	CA	92804
Virginia	De Vries	Willits	CA	95490
Jason	Greenberg	Capitola	CA	95010
Mark	Hotsenpiller	San Francisc	CA	94131
Tori	Reyes	Upland	CA	91784
David	Arrivee	Arroyo Grand	CA	93420
Jill	Alcantar	San Francisc	CA	94112
Lynda	Beigel	San Francisc	CA	94117
Linda	Carrier	San Francisc	CA	94117
Grace	Kajita	Sacramento	CA	95822
Christopher	Fabela	Mission Viejo	CA	92692
Nik	Jones	Huntington B	CA	92647
Anne	Corrigan	San Diego	CA	92104
Andrea	Gibson	Pasadena	CA	91104
Jan	Kampa	Soquel	CA	95073
D R	Spencer	San Diego	CA	92104
Angela	Embree	Oxnard	CA	93036
John	Kyrk	San Francisc	CA	94109
Patrick	Lewis	Emeryville	CA	94608
Lora	Ferrante	Walnut Creek	CA	94595
Charlotte	Hennessy	Oakland	CA	94602
Mark	Rhomberg	Pacific Palisac	CA	90272
Stephanie	Antonioli	Santa Cruz	CA	95062
Twila	Roth	Encinitas	CA	92023
Andrea	Graff	San Francisc	CA	94131
Leslie	Wilton	Escondido	CA	92029
Mary	Stanistreet	Ventura	CA	93003
Lynn	Ireland	Larkspur	CA	94977
Barbara	Bogard	Mill Valley	CA	94941
Kaye	Fontana	West Hollywo	CA	90069
Paul	Wellin	San Diego	CA	92131
Janessa	Caldwell	Signal Hill	CA	90755
Rachel	Mohan	Norwalk	CA	90650
Margaret	Maciborka	San Francisc	CA	94111
Christine	Lewis	Carlsbad	CA	92009
Marc	Babin	Napa	CA	94558
Todd	Shuman	Camarillo	CA	93010
John	Sexton	Carmel Valley	CA	93924
Freda	Hofland	Los Altos Hills	CA	94022

Irene	Isaacson	Sacramento	CA	95831
Elyse	Ashton	West Hollywo	CA	90069
Andy	Mannle	Los Angeles	CA	90016
Lee	Jordan	Los Angeles	CA	90056
Elizabeth	Johnson	Sacramento	CA	95831
Dave	Getzschman	Los Angeles	CA	90042
Jamie	Harker	La Canada	CA	91011
Azita	Tavana	San Jose	CA	95135
Craig & Elaine	Saltiel	Irvine	CA	92612
Sandra	Noah	Los Angeles	CA	90036
Dwight	Branscombe	Fort Bragg	CA	95437
Mary Ann	Gaido	Irvine	CA	92603
Laurel	Sillins	Oakland	CA	94605
Mj	Toppen	Los Alamitos	CA	90720
John	Harter	Marina	CA	93933
Marietta	Smith	Santa Monica	CA	90401
Phyllis	Chavez	Santa Monica	CA	90405
Kathleen	Dwyer	Monrovia	CA	91016
Isabel	Freeman	Topanga	CA	90290
Juan	Martinez	Escondido	CA	92026
Nan	Matthews	Pacifica	CA	94044
Timothy	Moder	Berkeley	CA	94703
Larry	Galpert	San Luis Obis	CA	93405
Cheryle	Besemer	San Diego	CA	92130
Jan	Coss	Davis	CA	95616
Carol	Garwood	Whittier	CA	90605
Stephanie	Hughes	Paradise	CA	95967
Wallace	Griswold	Sonoma	CA	95476
Daniell	Hepting	San Diego	CA	92116
Susan	Rutherford	Berkeley	CA	94703
Brian	Siebert	Encinitas	CA	92024
Janice	Sayano	North Hills	CA	91343
Sherry	Rusch	Idyllwild	CA	92549
Catherine	Hunter	La Crescenta	CA	91214
Judith	Skopek	Vista	CA	92084
Diana	Lubin	La Mesa	CA	91941
Lily	Scott	San Jose	CA	95112
Ray	Pingle	Shingle Sprin	CA	95682
Bill	Mccullough	Palm Springs	CA	92262
Michelle	Gallaher	Pine Grove	CA	95665
Ezrha Jean	Black	Los Angeles	CA	90027
Simone	Schad	Encinitas	CA	92024
Lucien	Plauzoles	Santa Monica	CA	90402
Laura	Gustoson	San Jose	CA	95128
Tricia	Woodward	Arroyo Grand	CA	93420
Susan	Covey	Palo Alto	CA	94306
Paula	Ong	San Carlos	CA	94070
Allen	Bohnert	Davis	CA	95618
John	Roevekamp	Santa Cruz	CA	95060
Lynn	Locher	Fremont	CA	94539
Nina	Mcnitzky	Redwood City	CA	94065
Gary	Green	Pasadena	CA	91107
Dorothy	Nirenstein	Kentfield	CA	94904
Shawnee	Mclemore	San Diego	CA	92126
Karla	Devine	Manhattan Be	CA	90266
Tim	Mancini	Fort Bragg	CA	95437
Odette	Mc Millan	Alameda	CA	94501
Pamela	Mcdonald	Riverside	CA	92505
Kyle	Mccauley	Los Angeles	CA	90066

Steve	Rosin	Pasadena	CA	91101
Nancy	Kane	Agoura Hills	CA	91301
Joseph	Zondlo	Santa Rosa	CA	95409
Suzan	Ormandy	Berkeley	CA	94703
Joe	Benson	Stockton	CA	95209
Latrenda	Hayden	Los Angeles	CA	90047
Claudia	Leonesio	Escondido	CA	92027
Dianna	Ploeger	Palm Springs	CA	92264
Timothy	Hoang	Fountain Valley	CA	92708
Toni	Ellingen	Escondido	CA	92025
John	Brady	Grass Valley	CA	95945
Clemet	Crossno	Laguna Beach	CA	92651
Liz	Fowler	Richmond	CA	94805
Carol	Huntsman	San Diego	CA	92111
Patricia	Scully	Sacramento	CA	95821
Jun	Iida	Costa Mesa	CA	92627
Perry	Ebadypour	Morgan Hill	CA	95037
David	Farwell	San Jose	CA	95132
Bruce	Borden	Palo Alto	CA	94306
Linda	Riebel	Lafayette	CA	94549
Peter	Harris	Mount Shasta	CA	96067
Daniel	Marsh	Modesto	CA	95351
Felena	Puentes	Bakersfield	CA	93312
Peter	Kuhn	San Diego	CA	92117
Valerie	Jones	Grass Valley	CA	95945
Sandra	Wawrytko	San Diego	CA	92126
Theresa	Mccormick	Oakland	CA	94607
Dana	Lund	Danville	CA	94526
Maggie	Hodges	Oakland	CA	94606
Rhys	Atkinson	San Rafael	CA	94903
Rhys	Atkinson	San Rafael	CA	94903
barbara	murray	L.A.	CA	90041
Charline	Ratcliff	Walnut Creek	CA	94596
Julie	Waddell	San Diego	CA	92131
Joan	Stern	Poway	CA	92064
Carl	Schloetel	Moorpark	CA	93021
Anne	Watts	Santa Rosa	CA	95401
Kaytee	Sumida	San Diego	CA	92120
Judith	Turner	Marina Del Rey	CA	90295
Ruth	Yacko	El Cajon	CA	92019
Rosa	Baeza	Reseda	CA	91335
Joanne	Simmons	Murrieta	CA	92562
Michelle	Epstein	Oakland	CA	94607
Nathan	Brigger	Nuevo	CA	92567
Antonio	Bryant	Inglewood	CA	90302
Pamela	Wellner	San Francisco	CA	94107
Nancy	Auker	Oakland	CA	94611
Francine	Kubrin	Los Angeles	CA	90049
Rebecca	Darr	Vallejo	CA	94590
Ernest	Isaacs	Berkeley	CA	94708
Robert	Gondell	Woodacre	CA	94973
Harry	Blumenthal	Eureka	CA	95501
Peter	Molloy	Penngrove	CA	94951
Stephanie	Smith	Scotts Valley	CA	95066
Mark	Kupke	Santa Rosa	CA	95401
Brad	Rae	Lake Forest	CA	92630
Rebecca	Morales	Brentwood	CA	94513
Bernard	Bruand	San Mateo	CA	94403
Scott	Smith	Murrieta	CA	92563

Cindy	Stein	Thousand Oal	CA	91360
Sherri	Gregory-Prue	Willits	CA	95490
L	Wang	Topanga	CA	90290
Ken	stein	Thousand Oal	CA	91360
Louise	Fleming	Torrance	CA	90504
Hannah	Young	Oakland	CA	94607
Melanie	Jackson	Santa Rosa	CA	95409
Natasha	Fischer	Olivehurst	CA	95961
Lisa	Patton	San Francisc	CA	94115
Christopher	Hollosi	Santa Clara	CA	95050
Cherri	Nash Shiffma	Walnut Creek	CA	94595
Ella	Duval	San Francisc	CA	94123
Julia	Mccarthy	Oakland	CA	94601
felisa	Hitchcock	San Francisc	CA	94110
Raymond	Yule	Fullerton	CA	92835
Gabriel	Gardner	Lakewood	CA	90712
Beverly	Graham	Los Angeles	CA	90038
Gabrielle	Du Verglas	Los Angeles	CA	90049
Amber	Sumrall	Soquel	CA	95073
Greg	Taylor	Paradise	CA	95969
Noel	Eaves	Red Bluff	CA	96080
Jerry	Wakman	Santa Rosa	CA	95404
Alice	Johnson	Sacramento	CA	95841
James	Dicarlo	San Francisc	CA	94111
Rima	Goode	Berkeley	CA	94710
Lori	Low	San Carlos	CA	94070
Ann	Rennacker	Fort Bragg	CA	95437
Nancy E	Kay	Carlsbad	CA	92009
Emilio	Verdugo	Los Angeles	CA	90066
Brandi	Royster	Long Beach	CA	90803
Rachel	Portenstein	El Segundo	CA	90245
William	Krickl	West Covina	CA	91790
Laura	Freeman	Sacramento	CA	95821
David	Goll	San Jose	CA	95123
Krishna	Venkatraman	San Francisc	CA	94122
Jose	Figueroa Jr	Fremont	CA	94536
Horacio	De La Cueva	Imperial Beac	CA	91932
Barbara	Norton	Pleasanton	CA	94588
Carol	Hewer	Ridgecrest	CA	93555
Robert	Dorenstreich	San Francisc	CA	94109
Ellen	Barron	Santa Cruz	CA	95060
Rob And Lind	Seltzer	Malibu	CA	90265
Karen	Bowden	Escondido	CA	92027
James Patrick	Goggins	Mill Valley	CA	94941
James	Pope	Paso Robles	CA	93446
Yukari	Okamoto	Santa Barbar	CA	93105
Mark	Robinson	Moreno Valley	CA	92557
Gerald	Shaia	Sun Valley	CA	91352
Larry	Downing	Port Hueneme	CA	93041
Travis	Richardson	Berkeley	CA	94710
Holly	Burgin	Van Nuys	CA	91405
Judith	Thielen-Butts	Mountain Vie	CA	94040
Malcolm	Clark	Mammoth Lal	CA	93546
Edward	Redig	Paso Robles	CA	93446
Rebecca	Davis	Santa Monica	CA	90404
Linda	Spanski	Oceanside	CA	92054
Lance	Thayer	Los Alamitos	CA	90720
Scott	Laster	Burbank	CA	91504
Tracey	Arnold	Calabasas	CA	91302

Clark	Quinn	Walnut Creek CA	94597
Msarie	Kane	San Francisc CA	94123
Marion	Barry	Loomis CA	95650
Mendel	Cohen	Oakland CA	94609
Brendon	Peacock	Long Beach CA	90807
Gladys	Kupper	San Francisc CA	94122
Kathy	Polletta	Fortuna CA	95540
Christen	Schilling	Glendale CA	91202
Helen	Hanna	Sacramento CA	95864
Candy	Frantz-Craft	Santa Cruz CA	95065
Marijane	Poulton	Trinidad CA	95570
Laura	Ross	Encinitas CA	92024
Helene	Zimmerman	Santa Monica CA	90401
Dagmar	Friedman	Kensington CA	94707
Stan & Pearl	Nydell	Laguna Nigue CA	92677
Terry	Licalsi	Castro Valley CA	94546
Leah	Olson	San Francisc CA	94117
Joyce	Kolasa	Springville CA	93265
Damiana	Hook	Los Angeles CA	90065
Heather	Bahr	Colfax CA	95713
Shaun Marie	Levin	Redwood City CA	94065
Geoffrey	Shaw	Upland CA	91786
Victoria	Hamman	San Francisc CA	94114
Cheryl	Parkins	Oakland CA	94611
Stephen	Fretz	Fresno CA	93711
Noelle	Filice-Smith	Loomis CA	95650
Ward	Mamluk	San Jose CA	95124
Lauren	O'Keefe	West Sacram CA	95605
Julie	Ries	Topanga CA	90290
Patricia	Borchmann	Escondido CA	92026
Victor	Mason	West Hollywo CA	90069
Vijay	Rohatgi	Solana Beach CA	92075
Jj	Jordan	Surfside CA	90743
Katharine	Warner	Sunland CA	91040
Tom	Pache	Pacifica CA	94044
g & b	martin	San Carlos CA	94070
Bob	Traer	Claremont CA	91711
Annette	Batehelor	Benicia CA	94510
Dianne	Dryer	Santa Cruz CA	95065
Natalie	Rios	Sacramento CA	95818
Mykael	Moss	Berkeley CA	94709
Mykael	Moss	Berkeley CA	94709
Ramon	Vega	Covina CA	91722
Lee	Castillo	Pinon Hills CA	92372
Maureen	Mehler	Laguna Wood CA	92637
Vijay	Rohatgi	Solana Beach CA	92075
Denise	Louie	San Francisc CA	94131
Lowell	Young	Mariposa CA	95338
Judy	Fishman	Los Angeles CA	90049
Rickey	Bostic	San Diego CA	92108
K. C.	McCarthy	Tarzana CA	91356
Justin	Herschel	West Hills CA	91307
Doug	Daniels	Costa Mesa CA	92626
Jack	Nounnan	Trinidad CA	95570
Louise	Monahan	Cloverdale CA	95425
Rebecca	Hopper	Santa Rosa CA	95405
Stephanie	Tidwell	Oakland CA	94606
Philip	Mcmorrow	Calabasas CA	91301
Vicki	Tomola	Point Arena CA	95468

Constance A	Ward	Roseville	CA	95661
Candace	Johnson	Long Beach	CA	90807
David	Tedds	Santa Clarita	CA	91350
Charlotte	Sonoda	Berkeley	CA	94709
Greg	Fisch	San Diego	CA	92126
Laura	Redwine	Carlsbad	CA	92009
Tony	Mrsich	Redwood City	CA	94061
Randy	Brase	San Bruno	CA	94066
Robert	Ridder	Santa Cruz	CA	95062
Marc	Vendetti	Fairfax	CA	94930
J	Hays	Davis	CA	95616
Robertta	Bailey	Elk Grove	CA	95624
Marlene	Denardo	Walnut Creek	CA	94595
Camilla	Comanich	Berkeley	CA	94707
Marie	Dolcini	Napa	CA	94559
David	Hansen	Pasadena	CA	91107
Jean G.	Cochran	Pomona	CA	91767
Lynn	Thorensen	Santa Cruz	CA	95060
Leslie	Cozad	Cotati	CA	94931
Lucia	Roncalli	Santa Rosa	CA	95404
Kathryn	Hardy	Petaluma	CA	94952
F. Michael	Montgomery	Santa Rosa	CA	95403
Hod	Gray	Santa Barbara	CA	93109
Virginia	Reinhart	Richmond	CA	94804
Amanda	Mayeda	Culver City	CA	90230
P	Shontz	Martinez	CA	94553
Donna	Sharee	San Francisco	CA	94112
Kathy	Yeomans	Ventura	CA	93001
Sylvia	Mcdougall	Concord	CA	94521
Walter	Holzinger	Porter Ranch	CA	91326
Annmarie	Lucchesi	San Jose	CA	95124
Donald	Cutty	Santa Barbara	CA	93111
Erin	Pence	Long Beach	CA	90804
Michael	Fraley	San Francisco	CA	94116
Barbara	Walder	Laguna Hills	CA	92653
Fawn	Caldwell	Menifee	CA	92585
Martha	Rader	Davis	CA	95616
Jim	Jacobs	Berkeley	CA	94702
Richard	Camp	Riverside	CA	92501
Jill	McDermit	Fullerton	CA	92832
Patricia	Shortt	Coronado	CA	92118
Mary Jane	Walker	Bay Point	CA	94565
Leiza	Duckworth	Poway	CA	92074
Martha	Karmann	Stockton	CA	95205
Jackie	Nichols	Foresthill	CA	95631
Faye	Gregory	Colton	CA	92324
Cheryl	Del Vecchio	Loomis	CA	95650
Tim	Nichols	Oakland	CA	94605
Kimberly	Young	San Francisco	CA	94115
James	Lovette-Black	San Francisco	CA	94114
Mara	Schoner	Idyllwild	CA	92549
Steve	Matusow	San Jose	CA	95125
Karin	Mcguire	Santa Cruz	CA	95062
Bruce & Cyntia	Stubbs	Carlsbad	CA	92010
Ali	Van Zee	Oakland	CA	94610
Julie	Clark	Petaluma	CA	94954
Margaret	Bradford	Pleasant Hill	CA	94523
Michael	Clarke	Salida	CA	95368
Prisca	Gloor Maung	Los Angeles	CA	90066

Rich	Belmontez	San Diego	CA	92115
David	Miotke	Berkeley	CA	94703
Laurie	Schick	Beverly Hills	CA	90211
Lynn	Bossone	Culver City	CA	90230
Nancy	Gutierrez	Palm Desert	CA	92260
David	Matoff	Los Angeles	CA	90025
Elizabeth	Rice	Camarillo	CA	93010
Carl	Mesick	El Dorado	CA	95623
Harlan	Lebo	La Mirada	CA	90637
Patty	Green	Carmichael	CA	95608
Judith	Goe	San Diego	CA	92102
Judy	Thier	Mill Valley	CA	94941
Darlene	Tunney Roser	Pismo Beach	CA	93449
Anthony	Thomas	North Hills	CA	91343
M	Coulter	Sacramento	CA	95814
Ellis	Heyer	San Rafael	CA	94903
Ellis	Heyer	San Rafael	CA	94903
Gary	Hansen	Tiburon	CA	94920
D J	Niccolls	San Francisco	CA	94121
Ivan	Lacore	Cayucos	CA	93430
Dan and Paul	Fogarty	Santa Rosa	CA	95409
Johnine	Majchrowicz	Oakland	CA	94611
Tanya	Baccarat	Petaluma	CA	94952
Javier	Andre	Alhambra	CA	91801
Mark	Bradley	Concord	CA	94520
James	Conn	Santa Monica	CA	90405
Frank	Gardner	Arroyo Grand	CA	93420
James	Lamm	Culver City	CA	90230
Julie	Brewster	Walnut Creek	CA	94597
Gloria	Maldonado	Redwood City	CA	94062
Tami	Armitage	Studio City	CA	91604
Enrico	Verga	Seal Beach	CA	90740
Jeff	Michel	Oakland	CA	94609
Clinton	Burdette	Los Angeles	CA	90066
Toby	Gottfried	Orinda	CA	94563
Pat	Mimeau	San Francisco	CA	94131
Sharon	Keller	El Cajon	CA	92020
Pat	Patterson	Claremont	CA	91711
Kenneth	Nemire	Soquel	CA	95073
Anna	Kokotovic	Goleta	CA	93117
Elfi	Gilford	Petaluma	CA	94952
Brad	Donahue	Los Angeles	CA	90066
Mary Etta	Moose	San Francisco	CA	94133
Deb	Gibbs	Nevada City	CA	95959
James	Fullerton	Scotts Valley	CA	95067
Elfi	Gilford	Petaluma	CA	94952
Sadie	Sullivan Greir	El Cajon	CA	92020
Sabrina	Howell	Campbell	CA	95011
Jan	Tache	Penn Valley	CA	95946
Frank	Hill	North Hollywood	CA	91601
Bryan	Ruff	Chico	CA	95973
Bob	Stockwell	Santa Cruz	CA	95060
Alicia	Hecht	Fullerton	CA	92831
Elaine	Berg	Simi Valley	CA	93065
Garth	Saalfeld	Fort Bragg	CA	95437
Richard	Nelesen	La Mesa	CA	91941
Hoyle	Kim	San Diego	CA	92130
Chris	Gilbert	Berkeley	CA	94707
Nurit	Baruch	San Francisco	CA	94115

Christine	James	Palo Alto	CA	94306
William A.	Talbott	Monrovia	CA	91016
Henry	Moreno	Valley Spring	CA	95252
Narayan	Rajan	Los Altos	CA	94024
Cynthia	Parrish	Los Angeles	CA	90034
William	Dudley	Menlo Park	CA	94026
Robert	Salinger	Claremont	CA	91711
Helen	Salyers	Mill Valley	CA	94942
Fred	Granlund	North Hollyw	CA	91601
Judy	Commons	Sacramento	CA	95821
Julie	Chan	San Luis Obis	CA	93401
Carl	Fulbright	Cypress	CA	90630
Marilyn	Corbisez	El Cajon	CA	92019
Erik	Schnabel	San Francisc	CA	94134
Varsha	Nene	Pleasanton	CA	94588
Christine	Johnson	Indio	CA	92201
John M	Keefe	South Pasade	CA	91030
Francis	Davis	Grass Valley	CA	95949
A	Adams	Cupertino	CA	95014
Zena	Ladish	Los Angeles	CA	90066
Lena	Fine	Campbell	CA	95008
Sue	Iri	Los Angeles	CA	90039
Pieter	Kark	San Mateo	CA	94401
Steffen	Rochel	Burlingame	CA	94010
Joe	Michael	Berkeley	CA	94702
Kathleen	Williams	Coarsegold	CA	93614
Denise	Lindsly	Walnut Creek	CA	94597
Phil	Gardner	Palm Desert	CA	92211
Jerry	Pruce	Jerry	CA	95560
Connie	Klemisch	Simi Valley	CA	93065
Myriam	Frausto	W Sacrament	CA	95605
Stefanie	Kaku	Carmel	CA	93922
Alex	Andresen	San Francisc	CA	94118
Hans	Wiesenfarth	San Diego	CA	92127
Norma	Odell	Chico	CA	95928
Daniel	Podell	Santa Rosa	CA	95404
Michael	Crosson	El Dorado Hill	CA	95762
Ted	Fishman	San Jose	CA	95123
Kristine	Raatz	Gold River	CA	95670
Rachael	Maciel	North Hollyw	CA	91605
Stephanie	Reavesdail	Los Angeles	CA	90034
Diane	Smith	Los Angeles	CA	90049
Caitlin	Alexander	Chatsworth	CA	91311
Pete	Van Hoorn	Livermore	CA	94550
Ian	McCullough	Sebastopol	CA	95472
Marcia	Teasdale	Monrovia	CA	91016
Alice M	Wallack	Roseville	CA	95661
Marcie	Keever	San Francisc	CA	94116
Adrianna	Mercado	Irvine	CA	92617
Jack	Milton	Davis	CA	95616
Rende	Lazure	Napa	CA	94559
Natacha	Lascano	Rocklin	CA	95765
Jamaica	Chenoweth	Nevada City	CA	95959
Cynthia	Zahorik	Thousand Oal	CA	91362
Patricia	Jing	Bakersfield	CA	93304
John	Hill Jr	Petaluma	CA	94952
Jeff	Lamppert	Tahoe City	CA	96145
Cary	Frazee	Eureka	CA	95503
Michael	Roberts	Pacific Palisac	CA	90272

Burjor & Corri	Dastur	Petaluma	CA	94954
Marjorie	Grace-Sayers	Los Angeles	CA	90034
Judith	Gloria	San Diego	CA	92104
Felicia	Chase	Encino	CA	91436
Susan	Self	Rocklin	CA	95677
Roger	Peterson	Santa Rosa	CA	95401
John	Murphy	Lake Forest	CA	92630
Alice M	Wallack	Roseville	CA	95661
Tamir A.	Lugman	Berkeley	CA	94703
Leanna	Sharp	Los Angeles	CA	90018
Marie	Perry	Ceres	CA	95307
Kathy	Knight	Santa Monica	CA	90405
Sarah	Stewart	Oakland	CA	94602
Kathleen	Helmer	West Hills	CA	91307
Robert	Carpino	Los Angeles	CA	90027
Brenda	Sherman	Chico	CA	95973
Cynthia	Leeder	San Jose	CA	95124
Staci	Evans	El Dorado Hill	CA	95762
Mary	Adams	Folsom	CA	95630
Ann	Gould Massou	Los Osos	CA	93402
Christine	Nadeau	Hercules	CA	94547
Carolyn	Sweeney	Richmond	CA	94804
Tamara	Napier	Newbury Park	CA	91320
Janet	Heck	Laguna Hills	CA	92653
David	Illig	Fair Oaks	CA	95628
Martha	Falkenberg	Woodside	CA	94062
Catalina	Maynard	San Diego	CA	92139
Helen	Williamson	Nevada City	CA	95959
Michelle	Schneider	Dana Point	CA	92629
Elizabeth	Luster	Malibu	CA	90265
Kelli	Davis	Castro Valley	CA	94552
Mary	Chieffe	Manhattan Be	CA	90266
Carol	Bennett	Glendale	CA	91207
Arthur	Chan	Concord	CA	94518
Hugh	O'Neill	Banning	CA	92220
Benjamin	Etgen	Sacramento	CA	95821
Sheila	Smith	Salinas	CA	93907
Susan	Basore	Fullerton	CA	92835
Susan	Basore	Fullerton	CA	92835
Tim	Wilson	Poway	CA	92064
Robin	Van Tassell	San Rafael	CA	94903
Robin	Van Tassell	San Rafael	CA	94903
Holly	Castrillon	Albany	CA	94706
Brittany	App	San Luis Obis	CA	93403
Lew	Douglas	Oakland	CA	94618
Mike	Starry	Fresno	CA	93726
Daryoosh	Khalilollahi	Berkeley	CA	94707
Mae	Harms	Garden Valley	CA	95633
Paula	Jain	Nevada City	CA	95959
Ruth & Juan	Molina	Temecula	CA	92592
Margaret	Goff	Novato	CA	94949
A	Viola	Stockton	CA	95209
Melissa	Sunderland	Sherman Oak	CA	91403
Yvette	Castro	Panorama Cit	CA	91412
Brian	Lilla	Oakland	CA	94609
Christina	Opel	San Francisc	CA	94115
Stan	Petersen	Mariposa	CA	95338
Carol	Anderson	Frazier Park	CA	93225
Kris	Scarci	San Diego	CA	92119

Laurence	George	Nicasio	CA	94946
Jena	Reid	Temecula	CA	92592
Joanne	Hattum	Diablo	CA	94528
Donna	Ingleson	Seal Beach	CA	90740
John Norman	Wade	Pescadero	CA	94060
Donald	Keeseey	San Jose	CA	95123
Kerry	Siekmann	Carlsbad	CA	92008
Elizabeth	Fisher	Pleasant Hill	CA	94523
Charlene	Kerchevall	Oceanside	CA	92054
Holly	Juch	Carmichael	CA	95608
Nancy	Hartman	Lafayette	CA	94549
Yvonne	Quilenderino	Seaside	CA	93955
Stan	Young	Oakland	CA	94611
Patricia & Ear	Williams	Rio Vista	CA	94571
Carol	Uschyk	Calistoga	CA	94515
Lawrence	Freedman	Los Angeles	CA	90024
Lawrence	Freedman	Los Angeles	CA	90024
Claire	Knox	McKinleyville	CA	95519
Lee	Eames	Long Beach	CA	90815
Jesus	Escatiola	Chino	CA	91710
Lynn	Howard	San Diego	CA	92109
Raymond	Hughes	Carlsbad	CA	92009
Michael	Noonan	Laguna Nigue	CA	92677
Paula	Zerzan	Sonoma	CA	95476
Cynthia	Phillips	Richmond	CA	94805
David	Hinkley	Santa Barbar	CA	93105
Cynthia	Mahoney	Danville	CA	94526
R	Wilkinson	Calabasas	CA	91302
Jhene	Canody	San Francisc	CA	94121
Michael	Henderson	Huntington B	CA	92649
Anna	Patten	Sugarloaf	CA	92386
Frank	Hill	North Hollyw	CA	91601
Yvonne	Roussel	Escondido	CA	92026
Steve	Comer	Duncans Mills	CA	95430
Ken	Choy	Sunland	CA	91040
Richard & Kar	Greenwood	Idyllwild	CA	92549
Walter	Bishop	Port Hueneme	CA	93041
Mark	Bachelor	San Anselmo	CA	94960
Thomas	Kline	Fort Bragg	CA	95437
Paul	Levesque	San Diego	CA	92103
Michael	Abler	Santa Cruz	CA	95062
Kristi	Iverson	Sunnyvale	CA	94087
James	Barnett	Corona	CA	92879
Greg	Movsesyan	McKinleyville	CA	95519
John C.	Foster	Crescent City	CA	95531
Sheryl	Lee	Topanga	CA	90290
Scott	Coahran	Los Banos	CA	93635
Jonathan	Wagman	Felton	CA	95018
Celine	Grenier	Capitola	CA	95010
Roger	Underhill	San Francisc	CA	94132
Bill	Hilton	Sunnyvale	CA	94087
Milt	Johnson	Winters	CA	95694
Ernie	Hartt	San Diego	CA	92130
Gerry	Williams	Thousand Oal	CA	91360
Sharon	Levy	Fullerton	CA	92831
Connie	Hannah	Goleta	CA	93117
Lisbeth	Kennelly	Venice	CA	90291
Helmut	Kloos	Fresno	CA	93703
Ronda	Dohse	San Jose	CA	95123

Bret	Thompson	Modesto	CA	95350
Denise	Alcazar	Northridge	CA	91324
Arnold	Gatti	Livermore	CA	94550
Veronica	Shannon	Fresno	CA	93727
James	Bigger	San Diego	CA	92117
Les	Borean	Torrance	CA	90505
Kellen	Morimoto	San Francisc	CA	94122
Jane	Jepson	Huntington B	CA	92649
Mari	Johnson	San Rafael	CA	94901
Erik	Klass	Los Angeles	CA	90034
Suzan	Clausen	San Diego	CA	92103
Lane	Graysen	Oroville	CA	95966
Roland	Salvato	San Francisc	CA	94109
Robert	Furst	Joshua Tree	CA	92252
Janet	Eyre	San Francisc	CA	94118
Donald	Rivenes	Grass Valley	CA	95945
Jeff	Weicher	Santa Monica	CA	90403
Elizabeth	Piepenbrink	Campbell	CA	95009
Suresh	Datla	Chino Hills	CA	91709
Tami	Campbell	Salinas	CA	93907
Charles	Turner	Chatsworth	CA	91311
Theresa	Perry	Sunland	CA	91040
Nanci	Kelly	San Diego	CA	92107
Gaile & Rick	Lytle	Turlock	CA	95382
Barbara	Bills	Placerville	CA	95667
Dick	Hannigan	Santa Rosa	CA	95409
Carmen	Benedet	Mill Valley	CA	94941
Michele	Powers	San Jose	CA	95124
Marie	Keefe	Burbank	CA	91506
R	D	Compton	CA	90059
Charles	Gaiennie	Los Angeles	CA	90042
Sharon	Budde	Concord	CA	94521
Michael	Blechman	Berkeley	CA	94703
Matthew	Foster	San Diego	CA	92101
Craig	Drizin	Santa Cruz	CA	95060
Catherine	Atherton	Los Angeles	CA	90049
Ray	Valadez	Santa Barbar	CA	93108
Bevrerly	Baker	Riverside	CA	92503
Michael	Kelly	San Francisc	CA	94118
Joyce	Lane	San Diego	CA	92115
Suellen	Rubin	Carmel	CA	93923
Barney	Levy	Santa Cruz	CA	95060
Ruth Eileen	Leatherman	San Rafael	CA	94903
Linda	Nicholas	Valencia	CA	91355
Martha	Shogren	Sebastopol	CA	95472
Christine	Murphy	La Mesa	CA	91941
Laura	Lind	Manhattan B	CA	90266
Mick	Terry	Canyon Coun	CA	91351
Ruth	Herring	San Francisc	CA	94112
Steven	White	San Jose	CA	95192
Cozette	Shenks	Sonoma	CA	95476
Peter	Berg	Burbank	CA	91505
Dawn	Baier	Oakhurst	CA	93644
Charles And F	Rossmann	Modesto	CA	95350
Robert	Falcon	Oakland	CA	94603
Ching-Yi	Lin	Vista	CA	92081
Isabel	Gorndt	Van Nuys	CA	91406
Stepheyne	Cambron	Hemet	CA	92544
Claudia	Freeman	Los Alamitos	CA	90720

Ann	Mahoney	Santa Barbar	CA	93103
Roberta	Reed	Huntington B	CA	92648
Ron	Marcelle	Novato	CA	94947
Stephen	Ludwig	Pacifica	CA	94044
Joan	Mettler	San Francisc	CA	94131
Andy	Cowitt	Oakland	CA	94610
Jane	Biggins, Esq	Ukiah	CA	95482
Mary	Waddell	Lancaster	CA	93536
Joan	Moricca	Pinole	CA	94564
Floyd	O'Brien	Stockton	CA	95204
John	Nowak	Santa Ana	CA	92704
Paul	Bechtel	Redlands	CA	92373
Christine	Brown	Camarillo	CA	93010
Benedetta	Santopietro	Escondido	CA	92026
Stuart	Goldstein	LAGUNITAS	CA	94938
Jean	Andrews	Santa Cruz	CA	95060
Vito	Degrigoli	Palm Springs	CA	92262
Eileen	Hale	Grass Valley	CA	95945
Gerry	Fightmaster	Windsor	CA	95492
Marc	Melinkoff	Woodland Hill	CA	91364
Ashley	Coover	San Francisc	CA	94118
Steve	Robey	Berkeley	CA	94708
Harry	Drandell	Fresno	CA	93721
Mark	Gallegos	Los Angeles	CA	90033
Rebecca	Enerson	South Lake T	CA	96150
Nicholas	Vance	Mountain Vie	CA	94043
Jean	Mont-Eton	San Francisc	CA	94116
Malcolm	Groome	Topanga	CA	90290
Amber	Morris	San Diego	CA	92108
Deborah	Mulvaney	San Francisc	CA	94105
Thomas	Rutsch	Elk Grove	CA	95758
Laurel	Tucker	Claremont	CA	91711
Michelle	Becker	Huntington B	CA	92647
Susan	Carlson	Davis	CA	95616
Camillo	Cipolla	Berkeley	CA	94703
Andrea	Rogoff	La Puente	CA	91744
James	Feichtl	Belmont	CA	94002
Bob	Ericson	San Jose	CA	95118
Jeanne	Hirshfield	Rancho Mirag	CA	92270
nikki	nicola	Davis	CA	95616
Curtis	Clark	Trinidad	CA	95570
Willow	Zarlow	Rodeo	CA	94572
Carol	Boyd	Escondido	CA	92027
Natalie	Rosen	Woodland Hill	CA	91364
Joyce	Mattoon	Yuba City	CA	95993
Donna	Thompson	Crescent City	CA	95531
Jane	Neufeld	San Jose	CA	95127
Dale	Lincoln	Long Beach	CA	90807
Chris	Baldwin	Redwood City	CA	94061
Deborah	Nudelman	El Cerrito	CA	94530
Quinn	Higgins	Pacifica	CA	94044
Milton	Bosch, M.D.	Napa	CA	94558
Scott	Troyer	Castro Valley	CA	94546
Rob	Porter	Carlsbad	CA	92008
Payal	Sampat	Albany	CA	94706
Tiffany	Le	Walnut Creek	CA	94596
Art	Van Kampen	Pasadena	CA	91104
Joseph	Gilbert	Ojai	CA	93023
Melitta	Von Abele	Pleasant Hill	CA	94523

Jordana	King	Los Angeles	CA	90035
Shirley	Eglinton	Emerald Hills	CA	94062
Velma	Weston	Elk Grove	CA	95624
Carole	Harbard	Sonoma	CA	95476
Matt	Woodward	Seal Beach	CA	90740
Tonya	Cockrell	Corona	CA	92882
Eagan	Wilson	San Mateo	CA	94401
Julian	Carter	Mill Valley	CA	94941
Elizabeth	Hogan	Los Angeles	CA	90036
Arthur	Lynn	Nevada City	CA	95959
Diana	Hall	Mountain View	CA	94041
Rod	Walton	Redwood City	CA	94063
Paul	Leonard	Santa Rosa	CA	95403
Robert	Firmin	Kensington	CA	94708
Judi	Naue	Manteca	CA	95337
Jayne	Crofoot	Kingsburg	CA	93631
Kenneth & An	Chraft	Simi Valley	CA	93063
Jayne	Crofoot	Kingsburg	CA	93631
Arthur	Harding	Eureka	CA	95503
Tim	Taylor	Los Angeles	CA	90064
Joan	Merrill	Pleasant Hill	CA	94523
Barbara	Luoma	Concord	CA	94521
Philip	Kane	Norco	CA	92860
Anne	Aldridge	Novato	CA	94947
Harlene	Brock	La Mesa	CA	91942
Eugene	Bunch	Alameda	CA	94501
Shanna	Loveman	Simi Valley	CA	93063
Ashley	Lewis	Fairfax	CA	94930
Lisa	Hoivik	Monterey	CA	93940
Richard	Miller	Nevada City	CA	95959
Mike	Silver	Sacramento	CA	95831
Harlene	Brock	La Mesa	CA	91942
Wayne	Anderson	Sacramento	CA	95818
Tim	Barrington	San Jose	CA	95126
George	Budd	Los Angeles	CA	90056
Damian	Cano	El Cerrito	CA	94530
Jana	Harker	Arcadia	CA	91066
Burnett	Watkins	San Diego	CA	92116
Al	Harris	Oakland	CA	94612
Craig	Browning	Alameda	CA	94501
Martin	Saitta	San Diego	CA	92115
Terri	Gedo	Los Angeles	CA	90045
Jill	Hersh	Nevada City	CA	95959
Sally	Dehart	Oakland	CA	94618
S	Kaehn	Oakland	CA	94601
Pk	Odle	Monterey Park	CA	91754
Jane	Block	Riverside	CA	92507
Dennis	Lew	Los Angeles	CA	90008
Daphne	Alexander	Redwood Vall	CA	95470
Lynn	Jacob	Santa Cruz	CA	95061
Roni	Andresen	Castro Valley	CA	94552
Faye	Soares	Pollock Pines	CA	95726
J	Brats	Los Angeles	CA	90036
Bob	Drury	Long Beach	CA	90814
Wayne	Ryan	Napa	CA	94558
Arthur	Trejo	Madera	CA	93636
Patricia	Janes	Atascadero	CA	93422
Sandra	Peterson	Danville	CA	94506
Christian	De Quincey	Half Moon Bay	CA	94019

Donald	Vasco	Berkeley	CA	94708
Raymie	Roland	Santa Rosa	CA	95404
Tyler	Griffin	Redlands	CA	92374
Garrine	Petersen	Sun Valley	CA	91352
Pilar	Hattori	Garden Grove	CA	92845
Alma	Sills	Visalia	CA	93277
Linda	Hunt	Berkeley	CA	94702
Diana	Kostka	Auburn	CA	95603
Don	Harmon	Murphys	CA	95247
Harriet	Miller	Redding	CA	96049
Christine	Sirias	Alhambra	CA	91801
Martin	Schaefer	El Cerrito	CA	94530
Steven	Arthur	Los Angeles	CA	90039
Jesse	Croxton	Venice	CA	90291
Soraya	Esfandiari	Concord	CA	94520
Daniel	Roddick	Pasadena	CA	91107
Pat	Kurzman	Oakland	CA	94612
Mary Ann	Finger	San Quentin	CA	94964
J	De Lu	Santa Cruz	CA	95065
June	Ehemann	Duarte	CA	91010
Anik	Charron	Marina DI Rey	CA	90292
Sylvia	Cardella	Hydesville	CA	95547
Mirthia	Romero	Menifee	CA	92584
Lynette	Coffey	Shasta Lake	CA	96019
Robert	Taylor	Clearlake	CA	95422
Paula	Pereira	Pittsburg	CA	94565
Donna	Leslie-Dennis	Long Beach	CA	90807
Devi	Ramanan	Palo Alto	CA	94306
Kristin	Young	San Diego	CA	92107
Rosa	Wynn	San Rafael	CA	94903
David	Falkner	San Diego	CA	92126
Peter	Tavernise	San Jose	CA	95125
Eddie	West	Desert Hot Sp	CA	92240
Linda	Kristenson	Atascadero	CA	93422
Dale	Sorensen	Inverness	CA	94937
Tom	Walsh	Oakland	CA	94610
Nathalie	Richcreek	Eureka	CA	95501
Judy	Hedstrom	Santa Cruz	CA	95060
Ann	Nuttall	Los Angeles	CA	90025
Mary	Boudreau	San Diego	CA	92128
Kirk	Casey	San Rafael	CA	94903
Jamie	Millican	Novato	CA	94945
Daniel	Castro	Bakersfield	CA	93304
Ruth	Persky	Los Angeles	CA	90035
Gina	Felicetta	Studio City	CA	91602
Philip	Rohr	Los Angeles	CA	90039
Bob	Mutascio	Venice	CA	90291
David	Cupples	Riverside	CA	92503
Susan	Magana	Tracy	CA	95377
Dedra	Hauser	Palo Alto	CA	94306
Christine	Oda	San Francisc	CA	94115
Philip	Fort	Oakland	CA	94607
Kevin	Fistanic	Los Angeles	CA	90066
Celia	Scott	Santa Cruz	CA	95060
Diana	Van Ormer	San Diego	CA	92128
Cindy	Voien	Whittier	CA	90605
Robert	Danders	San Francisc	CA	94121
Chris	Goldin	Berkeley	CA	94709
Sharon	Cavallo	Auburn	CA	95602

Cindy	Davenport	Oceanside	CA	92054
Jess	Graffell	Yucaipa	CA	92399
Gladys	Eddy-Lee	San Diego	CA	92115
Claire	Perricelli	Eureka	CA	95501
Mia	Dravis	Rancho Cucar	CA	91730
Vanessa	Gomez	Los Angeles	CA	90059
Susan	Strickland	West Hills	CA	91307
David	Lemberg	West Hollywo	CA	90046
Carol	Rigrod	Encino	CA	91316
Judith	Ellen	Cypress	CA	90630
Richard	Weinstock	Oxnard	CA	93035
Russ	Ramirez	Costa Mesa	CA	92627
Nance	Dubuc	Pasadena	CA	91104
Sandra	Christopher	Burbank	CA	91505
Jennifer	Novak	Napa	CA	94559
Craig	Bredeson	Newport Beac	CA	92663
Bruce & Jill	Hyman	Los Gatos	CA	95033
Sally	Smith	Sacramento	CA	95841
William	Rietzel	North Hollywo	CA	91601
Frank	Ferguson	Northridge	CA	91326
Jen	Padilla	Milpitas	CA	95035
Sherry	Vatter	Los Angeles	CA	90034
Jennifer	Hyde	San Diego	CA	92104
Bruce	Benson	Thousand Oal	CA	91320
Laura	Daniels	Cambria	CA	93428
Veronica	Quiris	Napa	CA	94558
Debra	Lewis	Hayward	CA	94541
James	Isoda	Vista	CA	92081
Marie	Lehman	Petaluma	CA	94954
Steven	Yellin	Menlo Park	CA	94025
Thomas	Becker	Grover Beach	CA	93433
Michael	Tomczyszyn	San Francisc	CA	94132
Leann	Krizek	Palmdale	CA	93552
Ravi	Shah	Los Angeles	CA	90024
Valerie	Schwartz	Los Angeles	CA	90027
Nancy	Goldberg	Los Angeles	CA	90066
Madelaine	Sutphin	Studio City	CA	91604
Lila	Trachtenberg	Santa Barbar	CA	93105
Robert	Gibson	Livermore	CA	94550
Phillip	Quadrini	Sausalito	CA	94965
Kathleen	Mccabe	Alameda	CA	94501
Lisa	Modenbach	Oakland	CA	94607
Jane	Reifer	Fullerton	CA	92832
Carol	Larkin	Oakland	CA	94611
Dale	Peterson	Berkeley	CA	94710
Karen	McCloughlin	Los Angeles	CA	90016
Norma	Edwards	Lakewood	CA	90712
Carol	Kuhn	Antioch	CA	94509
Catherine	Smith	Fresno	CA	93727
Lori	Christensen	San Diego	CA	92120
Helene	Robinson	Pine Grove	CA	95665
Rebecca	Frey	Ukiah	CA	95482
Carlo	Calabi	Angwin	CA	94508
Jason	Hashimoto	Los Angeles	CA	90066
John	Holroyd	Thousand Oal	CA	91360
Gregg	Sparkman	Palo Alto	CA	94301
T.	Welch	Beverly Hills	CA	90213
William	Rowland	Los Angeles	CA	90017
Douglas And	Coy	Bishop	CA	93514

Lisa	Geiszler	Lodi	CA	95242
Richard	Coolman	San Jose	CA	95125
Marie	Milliman	Ramona	CA	92065
Louise	Mehler	Sacramento	CA	95818
Hari	Busby	Hemet	CA	92544
Shelley	Strohm	Los Angeles	CA	90025
Erik	Kim-Holmgren	San Diego	CA	92111
Deborah	Miller	Monterey	CA	93940
Scott	Miller	Chico	CA	95973
Alan	Stemler	Davis	CA	95616
Hannelore	Wiseman	Crockett	CA	94525
Hannelore	Wiseman	Crockett	CA	94525
Carol	Savary	San Francisco	CA	94131
Greg	Kelley	Santee	CA	92071
Grace	Ramirez	Eureka	CA	95502
Dennis	Eicholtz	Chico	CA	95926
Mary Sue	Miller	Santa Barbara	CA	93108
Mike	Wisniewski	Hacienda Heights	CA	91745
Kathy	Shadle	Santa Monica	CA	90403
Stanley	Spear	Topanga	CA	90290
Katryn	Steelman	Redwood City	CA	94063
Norman	Moore	Madera	CA	93636
Sandra	Van Horn	Laguna Woods	CA	92637
Ashley	Felix	Riverside	CA	92506
Deborah	Quast	Santa Barbara	CA	93108
Albert	Metzger	Sierra Madre	CA	91024
Albert	Metzger	Sierra Madre	CA	91024
Anet	Gee	Northridge	CA	91327
Kathy	Stephens	El Cerrito	CA	94530
Erika	Anne	Oroville	CA	95966
John	Dymesich	Sonoma	CA	95370
Madeleine	Fisher-Kern	Los Angeles	CA	90036
Cindy	Davenport	Solana Beach	CA	92075
Rulon	Smith	San Francisco	CA	94114
June	Henry	La Crescenta	CA	91214
Anthony	Hopman	Union City	CA	94587
Sandra	Norell	Caliente	CA	93518
Andrew	Clark	Palo Alto	CA	94301
Rene	Huerta	Montclair	CA	91763
Sandra	Rosenberg	Oakland	CA	94611
Hygi	Waetermans	Cloverdale	CA	95425
Jeannie	Long	Sacramento	CA	95828
Richard	Kasbo	San Diego	CA	92104
David	Alford	Studio City	CA	91604
Diana	Blanton	San Diego	CA	92103
Lorie	James	Petaluma	CA	94952
Lorie	James	Petaluma	CA	94952
Nancy	Boyd	Woodland	CA	95695
Lindsay	Harlan	San Diego	CA	92106
Judy	Gage	Soquel	CA	95073
Joseph	Dadgari	Los Angeles	CA	90049
Nancy	Polito	Orangevale	CA	95662
Diana	Rothman	Santa Cruz	CA	95060
Jamie	Flaherty	Fresno	CA	93704
Norman	Mccord	North Hollywood	CA	91606
Allyson	Finkel	Rancho Santa Ana	CA	92688
Genette	Foster	Pasadena	CA	91106
Judith	Edwards-Reith	Sacramento	CA	95818
Jody	Olhiser	Santa Rosa	CA	95405

Jody	Olhiser	Santa Rosa	CA	95405
Jody	Olhiser	Santa Rosa	CA	95405
Linda	Thompson	Pleasant Hill	CA	94523
Paula	Berry	Los Angeles	CA	90024
Stephen	Anderson	Simi Valley	CA	93063
Evan	Mcdermit	Fullerton	CA	92832
Fernando	Morales	Hemet	CA	92544
Douglas	Evans	Ojai	CA	93024
William	Wollner	Stockton	CA	95202
Gregory	Nelson	San Pedro	CA	90732
Jane	Yett	Santa Cruz	CA	95060
David	Fura	San Francisc	CA	94133
Jim	Jennings	Woodland Hill	CA	91303
Joan	Hunnicutt	Citrus Height	CA	95621
Mary Hope	Mcdonnell	Oakland	CA	94609
Crystal	Million	San Diego	CA	92130
Larry	Bidinian	Felton	CA	95018
Betty	Kerswill	Placerville	CA	95667
Martha	Ronk	Los Angeles	CA	90041
Maryann	Khan	Oceanside	CA	92057
Kevin	Toney	Richmond	CA	94803
Cassandra	Williams	Brawley	CA	92227
Sam	Ford	San Jose	CA	95117
David	Zebker	San Francisc	CA	94102
Margaret	Talbot	Oakland	CA	94602
Lisa	Gee	La Crescenta	CA	91224
Jerry and Sus	Faunce	Berry Creek	CA	95916
Betsy	Marstall	Half Moon Ba	CA	94019
Lynn	Camhi	Petaluma	CA	94952
Steven	Hibshman	Foster City	CA	94404
Shabad	Khalsa	Sacramento	CA	95831
Louise	Arnold	San Francisc	CA	94109
Kelly	Hyde	Hayward	CA	94541
Peggy	Luna	Pleasant Hill	CA	94523
Kenneth	Gibson	Oakland	CA	94602
Irene	Dunny	San Diego	CA	92127
Susan	Driver	Sacramento	CA	95816
David	Boyer	Palo Alto	CA	94304
Michelle	Harms	Bonita	CA	91902
Kathy	Grant	Nevada City	CA	95959
Rick	Kemenesi	West Covina	CA	91791
Gary	Murphy	Los Angeles	CA	90045
Anne	Bush	Berkeley	CA	94710
Angela	Steyer	Redwood City	CA	94062
Joanne	Katzen	Aptos	CA	95003
Tracey	Archer	Lincoln	CA	95648
Thomas	Reynolds	Los Osos	CA	93402
Stephne	Macintosh	Antioch	CA	94509
Deanna	Sotelo	Oakley	CA	94561
Sheedy	Dehdashti	Del Mar	CA	92014
Craig	Warren	Napa	CA	94558
Leslie	Hendricks	San Francisc	CA	94122
Suzanne	Pena	Fullerton	CA	92835
Emily	Bryant	Los Alamitos	CA	90720
Victoria	Best	Santa Monica	CA	90405
Billie	Orechovesky	El Cajon	CA	92020
Rita	Henry	Simi Valley	CA	93065
John	Hyde	San Leandro	CA	94577
David	Lorch	Canoga Park	CA	91304

Arthur	Bierman	San Francisc	CA	94133
Behnoosh	Armani	Brea	CA	92821
Josephine	Wall	Pinole	CA	94564
Keith	Rhinehart	Santa Clara	CA	95050
Corinne	Greenberg	Berkeley	CA	94707
Donald And B	Wolf	Santa Rosa	CA	95401
Jeri	Fonte	Redondo Bea	CA	90277
Joseph	Sutton	San Francisc	CA	94116
Nancy	Blastos	Redlands	CA	92373
Barbara	Blake	Los Angeles	CA	90065
Jason	Thomas	Shasta Lake	CA	96019
Michael	Weaver	Citrus Height	CA	95610
Will	Harnage	Santa Rosa	CA	95405
Heather	Smee-Fosbur	Grass Valley	CA	95945
Tara	Yarlagadda	Lafayette	CA	94549
Gina	Vanegas	Encino	CA	91436
Jay	Atkinson	El Sobrante	CA	94803
Beatrice	Sadeghi	Gold River	CA	95670
Lori	Waller	San Diego	CA	92104
Teresa	Travis	Campo	CA	91906
Denise	Wixom	Carmichael	CA	95608
Anne	Rochman	Anza	CA	92539
Valarie	Prince	Aliso Viejo	CA	92656
Lynne	Landers	Vista	CA	92084
John	Varga	Huntington B	CA	92648
Darien	Huey	Magalia	CA	95954
Donna	Forst	Santa Rosa	CA	95409
Richard	Taylor	San Mateo	CA	94403
Steph	Clark	Pleasant Hill	CA	94523
Patti	Bosler	Salinas	CA	93901
Thomas	Lawson	Long Beach	CA	90802
Kurtis	Krumdick	Visalia	CA	93292
Teri	Forester	Citrus Height	CA	95610
John & Sue	Scott	Butte Valley	CA	95965
Carla	Kerr	Redding	CA	96001
Debbie	Lundberg	Dublin	CA	94568
Margaret	Madsen	Soquel	CA	95073
Nicole	Holland	Arcata	CA	95521
Kathleen	Sigel	Oak View	CA	93022
A	L	San Luis Obis	CA	93406
Lynn	Lovingood	Corona	CA	92880
David	Gray	Novato	CA	94949
Chrysanthi	Lawrence	Richmond	CA	94805
Susan	Clarkson	Carmichael	CA	95608
Cathi	Soule	Clayton	CA	94517
Marytheresa	Martini	Adelanto	CA	92301
Cynthia	Ivans-Ussery	Lodi	CA	95240
L.	Bowlen	Fresno	CA	93710
Marielena	Sosa	Los Angeles	CA	90022
Kenneth	Mcclintic	Signal Hill	CA	90755
Phil	Hawkins	Pasadena	CA	91104
Edward	Schmookler	Berkeley	CA	94710
Patricia	Ladue	Ojai	CA	93023
Katarina	Grabowsky	Castro Valley	CA	94546
Roxanne	Alzaga	Covina	CA	91722
Elizabeth	Gann	Lake Arrowhe	CA	92352
Jody	Timms	Fairfax	CA	94930
Alison Dayne	Frankel	Tarzana	CA	91356
Patricia	Valdez	Sacramento	CA	95833

Tanya	Baldwin	Los Gatos	CA	95032
Robert	Pann	Los Angeles	CA	90064
Alan	Weiner	Agoura Hills	CA	91301
Jazzmyne	Oda	San Francisco	CA	94115
J	Hynd	Los Angeles	CA	90027
Robert	Bondurant	Glendale	CA	91203
Angela	West	San Diego	CA	92119
Stephen	Weitz	Oakland	CA	94619
Linda	Goetz	Mountain View	CA	94040
Adam	Nunez	Anaheim	CA	92807
Julie	Ostoich	Sacramento	CA	95826
Holly	Wachlin	Grass Valley	CA	95949
Joanie	Misrack	San Rafael	CA	94901
Marianna	Mejia	Soquel	CA	95073
Bethany	Eldred	Simi Valley	CA	93065
Katherine	Harband	San Rafael	CA	94913
Tara	Huhn	Long Beach	CA	90810
Deborah	Holcomb	Los Angeles	CA	90025
Eva	Rivera	Mission Hills	CA	91345
Dorothy	Varellas	San Francisco	CA	94124
Rawan	Almomani	Monterey Park	CA	91755
Renee	Krueger	Pacific Grove	CA	93950
John	Cornish	Concord	CA	94521
Jennifer	Biswas	Culver City	CA	90232
Maritza	Martinez	San Dimas	CA	91773
Rhonda	Rivard	Rocklin	CA	95677
Johnny	Bao	Santa Monica	CA	90404
Doyle	Wegner	San Leandro	CA	94579
Janice	Vieth	Covina	CA	91724
Renata	Landres	Los Angeles	CA	90049
Judy	Fraley	Corona	CA	92879
elizabeth	Daniels-Curre	Chico	CA	95926
Christina	Almeida	Roseville	CA	95747
Sharon	Paltin	Laytonville	CA	95454
Lynn	Armstrong	El Cerrito	CA	94530
Jim	Solum	Long Beach	CA	90813
Pamela	Johnson	Fair Oaks	CA	95628
Joe	Rivera	Redwood City	CA	94063
Rachel	Kelley	Santa Monica	CA	90405
Tina	Andreatta	Aptos	CA	95003
Karen	Aenlle	Altadena	CA	91001
Janny	Vogel	Oceanside	CA	92057
Dorothy	Mirmak	Yorba Linda	CA	92887
Vicki	Bingo	Los Angeles	CA	90036
Vicki	Keyak	San Francisco	CA	94116
Rebeca	Byerley	San Dimas	CA	91773
Lori	M	Berkeley	CA	94704
Mary	Coleman	Orangevale	CA	95662
Fred	Rinne	San Francisco	CA	94112
Susan	Shaberman	Santa Barbara	CA	93110
Mary	Costello	San Jose	CA	95136
Eric	Zakin	San Mateo	CA	94403
Ralph	Thomas	Chula Vista	CA	91915
Kitty	Sheehan	Thousand Oaks	CA	91362
Frances	Logan	San Diego	CA	92117
Kathy	OBrien	Redway	CA	95560
Vanessa	Leon	Inglewood	CA	90302
Lauren	Sygiel	Oakland	CA	94606
Julie	Gall	Imperial Beach	CA	91932

Diego	Almora	Sherman Oak	CA	91401
Todd	Copeland	Ventura	CA	93003
Guadalupe	Jimenez	Los Angeles	CA	90042
Bonita	W	Oakland	CA	94611
William	McGuire	San Francisc	CA	94118
Marlene	Ortega	Ontario	CA	91762
Laura	Rasmussen	Santa Barbar	CA	93109
Rachel	Amalia	San Francisc	CA	94117
Rodiah	Peters	Petaluma	CA	94952
Suzan	Syrett	Menlo Park	CA	94025
Jan	Repp	Baldwin Park	CA	91706
Sharon	McFalls	El Cajon	CA	92021
Michael	White	Los Angeles	CA	90059
Esther	Daniels	Vista	CA	92081
Chandra	Perkins	Fontana	CA	92335
Lesley	Shultz	Oakland	CA	94610
Agnes	Puntch	Rodeo	CA	94572
Kathy	Jones	Benicia	CA	94510
Beth	Rees	Carmichael	CA	95608
Tom	Wyman	Riverside	CA	92501
Nina	Brown	Santa Barbar	CA	93105
Janet	Hendrick	Imperial Beac	CA	91932
John	Giles	Cameron Park	CA	95682
Theresa	Mullally	Pasadena	CA	91106
Ann	Haefele	Hollister	CA	95023
Annetta	Bettis	Laguna Hills	CA	92653
A	Hernday	Santa Rosa	CA	95409
Sally	Prendergast	Encinitas	CA	92024
Diana	Dee	North Hollywo	CA	91606
Rebecca	Holzer	Huntington B	CA	92646
Kayla	Nason	Hercules	CA	94547
Brooke	Knight	Ventura	CA	93002
Beth	Goode	Topanga	CA	90290
carolyn	anderson	Sutter Creek	CA	95685
carolyn	anderson	Sutter Creek	CA	95685
carolyn	anderson	Sutter Creek	CA	95685
Lenore	Rodah	South Pasade	CA	91030
James	Fish	Castro Valley	CA	94546
Veronica	Aguirre-Kolb	Carpinteria	CA	93013
Marco	Van Erp	Santa Monica	CA	90403
Emily	Damm	Sacramento	CA	95822
Mana-Jean	Wagnon	Alameda	CA	94501
Theresa	Rettinghouse	Alameda	CA	94501
Barbara	Small	Fortuna	CA	95540
Christen	Smith	Lewiston	CA	96052
Ben	Milikien	Truckee	CA	96162
Patricia	Wilson	Berkeley	CA	94707
Dianna	Wood	Tehachapi	CA	93561
Trina	Aurin	Foothill Ranch	CA	92610
Nicholas	Huffmaster	San Diego	CA	92116
Nam	Kaur	Santa Barbar	CA	93109
Sue	Walden	San Francisc	CA	94109
Inge	Mueller	Venice	CA	90291
Rose Marie	Jacobs	Davenport	CA	95017
Rose Marie	Jacobs	Davenport	CA	95017
Maria	Koci	Oakland	CA	94609
Amanda	Rosenberg	Oakland	CA	94606
Edward	Glover	Palo Alto	CA	94304
Mark	Andersen	Alameda	CA	94501

Anita	Schulz	Seal Beach	CA	90740
Gregory	Nelson	Warner Sprin	CA	92086
Marjorie	Xavier	Hayward	CA	94542
Diane	Carney	Sacramento	CA	95864
Kirk	Nason	Huntington B	CA	92648
Yisroel	Feldman	Novato	CA	94945
Terry	O'Neal-O'Rou	Ferndale	CA	95536
Sara	Williams	Sherman Oak	CA	91423
William	Cawthra	San Diego	CA	92105
Susan	De'Armond	Corona	CA	92883
David	Doering	San Francisc	CA	94109
William	Thompson	Graeagle	CA	96103
Stacia	Dawson	Del Mar	CA	92014
Lori	Crockett	Mount Shasta	CA	96067
Nes	Rocha	Oakhurst	CA	93644
Steven	Schultz	Albany	CA	94706
Tim	Butler	San Francisc	CA	94109
Jeff & Sylvia	Davis	Santa Rosa	CA	95409
Sylvia	De Rooy	Eureka	CA	95503
Josephine	Moore	Oceanside	CA	92054
George	Yenoki	Monrovia	CA	91016
Claire	Watson	Pleasant Hill	CA	94523
Dashiell	Dunkell	Santa Cruz	CA	95060
Colleen	Fedor	Alameda	CA	94501
Tony	Zaccagnino	Los Angeles	CA	90066
Andrew	Sutphin	Westlake Vill	CA	91362
Carl	Orr	Del Mar	CA	92014
George	Cleveland	Santa Clara	CA	95051
Roberta Lee	Holt	Stockton	CA	95207
Zachary	Morris	Chico	CA	95928
Steven	Carter	Alhambra	CA	91801
Doug	Miller	San Rafael	CA	94903
John	Nordstrom	San Diego	CA	92177
Dick	Vittitow	Santa Cruz	CA	95060
Robert	Harrison	Forestville	CA	95436
Sanna	Thomas	Mill Valley	CA	94941
K.	Lee	San Leandro	CA	94577
Corinna	Bechko	Los Angeles	CA	90065
Stacy	Cornelius	Laguna Beach	CA	92651
Chaka	Carter	Burbank	CA	91505
Todd	Heiler	Ferndale	CA	95536
Anna	Jacopetti	Santa Rosa	CA	95403
Michael	Rotcher	Mission Viejo	CA	92692
Lillian	Paynter	Oxnard	CA	93035
Mary	Lunetta	San Diego	CA	92103
Tim	Donovan	Aptos	CA	95003
ANGELA C.	EMBREE	OXNARD	CA	93036
Marjorie	Krauser	Pinole	CA	94564
Kyle	Heger	Albany	CA	94706
Paul	Katz	Aromas	CA	95004
Grania	Lindberg	Napa	CA	94559
Joyce	Robinson	Twentynine P	CA	92277
Meryl	Wilsker	Boulder Creek	CA	95006
Kathy	Poseley	Orangevale	CA	95662
Andea	Iaderosa	Los Angeles	CA	90027
Rita	Melton	Redwood City	CA	94061
Christina	Bulskov	Encinitas	CA	92024
Lucretia	Jevne	vacaville	CA	95688
Paul	Koehler	Oakland	CA	94611

Gary	Feemster	Huntington B	CA	92649
Courtney	Falotico-Zam	San Jose	CA	95128
Judy	Marsh	Los Angeles	CA	90066
Ann	Charlesworth	Ojai	CA	93023
Justin	Chernow	Paso Robles	CA	93446
C & D	Blakesley	Foothill Ranch	CA	92610
Novera	Spector	Carlsbad	CA	92008
Robin	Piane	Santa Rosa	CA	95409
Marian K.	Gerecke	Claremont	CA	91711
Barri	Clark	Los Angeles	CA	90038
Andy	Fesler	Carlsbad	CA	92008
Sally	Nelson	Temecula	CA	92591
Emmylou	Gutierrez	Fresno	CA	93710
Laura	Carmona-Mar	Ventura	CA	93001
N.	Leseigneur	Santa Rosa	CA	95404
Brigitte	James	Upland	CA	91784
Anthony	Smrdeli	Santa Clara	CA	95051
Brian	Mertan	Monrovia	CA	91016
Joan & David	Fisher	Huntington B	CA	92647
Marianne	Daransky-Kar	Van Nuys	CA	91405
Heather	White	Rancho Palos	CA	90275
Donald	Eidam	Fair Oaks	CA	95628
Dianne	Winne	Dianne	CA	94602
Maria	Garcia	Gardena	CA	90247
Holly	Mcvey	Los Angeles	CA	90046
Ruth	Crump	Redwood City	CA	94061
Sharon	Kocher	Sebastopol	CA	95472
Carole	Shelton	Auburn	CA	95602
Joni	Jones	Seal Beach	CA	90740
Kristina	Shook	Beverly Hills	CA	90211
William	Dahnke	Poway	CA	92064
Marcus	Mendiola	San Juan Bau	CA	95045
Diana	Somps	Novato	CA	94945
Robert	Pangelina	Richmond	CA	94805
Jen	Bradford	Spring Valley	CA	91977
Stephen	Sacks	Fresno	CA	93704
Martha	Wall	Novato	CA	94945
Frank	Ortiz	Los Angeles	CA	90022
Christine	Hayes	Upland	CA	91786
Linda	Calderon	Oxnard	CA	93034
Gabrielle	Ebert	Los Angeles	CA	90039
Jennifer	Zur	Sebastopol	CA	95472
Sally	Mcfarland	Sacramento	CA	95818
C	Martinez	San Diego	CA	92104
Leslie	Young	Bloomington	CA	92316
Jonel	Lancaster	Anaheim	CA	92804
Saundra	Hodges	Castro Valley	CA	94546
Timothy	Davis	Garden Grove	CA	92845
Cheryl	Whitney	Long Beach	CA	90815
Stephanie	Anderson	Palmdale	CA	93551
Peter	Altman	Davis	CA	95616
Peter	Altman	Davis	CA	95616
Lupita	Curiel	Lamont	CA	93241
Abraham	Oboruemuh	Riverside	CA	92515
Regina	Flores	Lake Elsinore	CA	92532
Lawrence Mar	Olson	Glendora	CA	91740
Jill	Zamek	Arroyo Grand	CA	93420
John	Hollenberg	Canoga Park	CA	91304
Meg	Brown	New Cuyama	CA	93254

Kathie	Kingett	La Habra Heiç CA	90631
Kathie	Kingett	La Habra Heiç CA	90631
Anne	Veraldi	San Francisc CA	94110
Alice	Newton	Menlo Park CA	94025
Sharon	Lacy	Sebastopol CA	95472
Brian	Gray	Fair Oaks CA	95628
Alanna	Suen	San Francisc CA	94121
Karen	Stewart	Napa CA	94558
Beverly	Magid	Sherman Oak CA	91423
Nicolette	Froehlich	Acampo CA	95220
Horace	Gray	Hayward CA	94541
Michelle	Tardiff	Rancho Cucar CA	91739
Amanda	Freitas	Berkeley CA	94707
Victoria	Foraker	Los Angeles CA	90026
Susan	Temple	Long Beach CA	90808
Victoria	Flamenco	Mountain Vie CA	94043
Denise	Edwards	Redding CA	96002
Mary	Young	La Mesa CA	91941
Jeffery	Dorer	Los Angeles CA	90042
Elvis	Johnson	San Anselmo CA	94960
Lauren	Obrien	Santa Monica CA	90403
Wienke	Tax	Richmond CA	94804
Alexandra	Davison	Middletown CA	95461
Noreen	Weeden	San Francisc CA	94107
Ernie	Walters	Union City CA	94587
Christopher	Ocepek	Pasadena CA	91101
Naomi	Stein	Oakland CA	94618
Janet	Schaefer	Murrieta CA	92563
Michael	Sanderson	Chico CA	95973
Tara	O'Riley	Santa Rosa CA	95401
Dennis	Scacco	San Francisc CA	94122
Catherine	Bruington	Riverside CA	92507
Mindy	Schmidt	Los Angeles CA	90035
Richard	Sanders	San Diego CA	92104
Shari	Eubanks	North Hollywo CA	91601
Barbara	Rivenes	Grass Valley CA	95945
Eugenia	Larson	San Ramon CA	94582
Carol	Ellenberger	Morgan Hill CA	95037
Linda	Masuoka	Redondo Bear CA	90277
Taylor	Reed	Sunset Beach CA	90742
Louise	Rangel	Santa Paula CA	93060
Allyson	Johnson	Los Altos CA	94024
Brice	Beckham	West Hollywo CA	90046
Charles	Hernandez	North Hollywo CA	91606
Bernabe	Contreras	Arcadia CA	91006
Robert	Chacon	Beaumont CA	92223
Karen	Warren	Mountain Vie CA	94043
Kerri	King	Aguanga CA	92536
John	Sinclair	Santa Rosa CA	95409
Michele	Santoro	Davis CA	95616
Donna	Watson	Sacramento CA	95833
Gustavo	Padilla	San Diego CA	92117
Laszlo	Kurucz	Lake Forest CA	92630
Jaqi	Thompson-As	Richmond CA	94804
Adriana	Baltazar	Los Angeles CA	90031
Lynnette	Delgado	Hercules CA	94547
Avondus	Jackson	Alameda CA	94501
Brooke	Johnson	Los Angeles CA	90036
Glenn	Mullins	Buena Park CA	90620

Peter	Sullivan	Santa Monica	CA	90404
Alina	Orendain	San Diego	CA	92154
Yoav	Getzler	Valley Village	CA	91607
Erica	Johnson	Gardena	CA	90249
Lesle	Helgason	Pebble Beach	CA	93953
Muriel	Mahrer	Saratoga	CA	95070
Bronte	Kass	Los Gatos	CA	95030
Helen	Prusiner	San Francisc	CA	94123
Robert	Williams	Crescent City	CA	95531
Scott	Peer	Glendale	CA	91205
Paul	Reiser	Camarillo	CA	93010
Roger	Lema	Hayward	CA	94541
David	Burtis	Calistoga	CA	94515
Mark	Merz	Morgan Hill	CA	95037
Gary	Hartsough	Sacramento	CA	95819
Kevin	Wever	Pioneer	CA	95666
Michael	Riser	Oroville	CA	95966
Dawn	Salois	Costa Mesa	CA	92626
Sharon	Marquez	Placerville	CA	95667
Thomas	Lawer	Palo Alto	CA	94306
Steve	Loe	Yucaipa	CA	92399
Suzi	Schoensee	Sattley	CA	96124
Cole	Mountain	Mendocino	CA	96460
Andrew	Bearer	Arcata	CA	95521
Tara	Brown	Sn Bdn	CA	92407
Tara	Brown	Sn Bdn	CA	92407
Tara	Brown	Sn Bdn	CA	92407
Victor	Afanasiev	La Grange	CA	95329
Annette	Pirrone	San Anselmo	CA	94960
Cheryl	Kozanitas	San Mateo	CA	94403
Donald	Cousino	Chula Vista	CA	91913
Carla	Montagno	Coarsegold	CA	93614
Colin	Klingman	San Francisc	CA	94110
Claudette	Begin	Union City	CA	94587
Zola	Hauge	Beaumont	CA	92223
Mark E.	Smith	San Diego	CA	92101
David	Reed	Guerneville	CA	95446
Mate	Klakovich	Newhall	CA	91321
Anello	Arne	Castella	CA	96017
Mike	Laquatra	Long Beach	CA	90806
Sean	Bishop	San Diego	CA	92116
Pamela	Gibberman	Panorama Cit	CA	91402
Elizabeth	Shore	San Anselmo	CA	94979
Lori	Korioth	Long Beach	CA	90807
Atreyu	Archer	Oakley	CA	94561
Victor	Gonzalez	Los Angeles	CA	90005
Lynn	Quirolo	Albany	CA	94706
Dolores	Gonzalez	South San Fr	CA	94080
Regina	Simpson	Chico	CA	95926
Juliet	Schmitt	Carlsbad	CA	92010
Rebecca	Zondlo	Glendora	CA	91740
Stacia	Lloyd	Norco	CA	92860
Suzanne	Kent	Santa Cruz	CA	95060
B	Chan	San Diego	CA	92131
John	Powers	Forestville	CA	95436
Susan	Rockwell	Sausalito	CA	94965
Kwok	Chan	San Jose	CA	95131
Aleta	Johnson	Soquel	CA	95073
Anika	B.	Long Beach	CA	90804

Nancy	Ellestad	El Cajon	CA	92020
Matthew	Davila	Modesto	CA	95355
Van	Glandon	San Francisco	CA	94117
Katherine	Buckley-Smit	Richmond	CA	94804
Jt	Lawson	Los Angeles	CA	90027
Desiree	Herrera	Lake Forest	CA	92630
Nancy	Smith	Santa Monica	CA	90401
Diana	Keane	Riverside	CA	92504
Stacy	Mccurry	Whittier	CA	90606
J	Pizzo	Corte Madera	CA	94925
Miranda	Macdonald	Simi Valley	CA	93065
Vicki	Spencer	Rialto	CA	92376
Catherine	Vargas	Los Angeles	CA	90047
Catherine	Vargas	Los Angeles	CA	90047
Janet	Rohrbacher	Culver City	CA	90230
Janet	Rohrbacher	Culver City	CA	90230
James	Moschetti	Red Bluff	CA	96080
James	Moschetti	Red Bluff	CA	96080
David	Berry	Los Angeles	CA	90024
Charlene	Simons	Santa Rosa	CA	95409
Mary-Jo	Robertson	Los Angeles	CA	90064
Sheryl	Silverman	Culver City	CA	90232
Debra	Dunlop	Clearlake Oak	CA	95423
Debra	Dunlop	Clearlake Oak	CA	95423
Elaine	Wilson	Torrance	CA	90501

From: Gerda Seaman, Chico CA 95926

I want to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Mark Bartleman, Laguna Beach CA 92651

I appreciate the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in methane pollution from the oil and gas industry. The comprehensive scope of these rules --including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon-- avoid many of the loopholes and weaknesses of other state and federal standards.

To ensure these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions including:

- * Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- * Do not exempt sources of methane such as low-bleed pneumatics;

* Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards, and I urge the Air Resources Board to implement the strongest rules possible without delay.

Thank
you.

From: Meg Madden, San Francisco CA 94133

Thank you so much! I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Janet Smarr, La Jolla CA 92037

I wish to thank the Air Resources Board for developing important rules to help prevent methane pollution from the oil and gas industry in California, and to urge the agency to finalize these safeguards as swiftly as possible, despite resistance from the oil and gas industry.

Full and prompt implementation of these new protections would make California a national leader in controlling climate-changing and health-destroying methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites

such as Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards. Please stick to these strong standards.

In fact, the Air Resources Board could further strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a clear demonstration that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. I strongly support these new safeguards and urge the Air Resources Board to implement quickly the strongest rules possible.

Thank you.

From: George Durgerian, San Francisco CA 94121

Its an independent voter and native Californian, I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Liz Amsden, Los Angeles CA 90042

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

I would also request that individuals responsible - those who made the decisions that saving money was more important than ensuring people were not put at risk and their supervisors all the way to the top - be PERSONALLY held responsible and appropriately fined. UNTIL this is done, corporate executives will continue to flaunt the law and hide behind the corporate veil.

With lives and the environment at stake, this can no longer be permitted.

Full implementation of this as well as the CARB's new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Mathew Clark, Campbell CA 95008

I'm a real person and I endorse the message below, and have added my own thoughts in the final paragraph.-- Mathew Douglas Clark

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. I also recognize the strong impact of methane in the atmosphere as a greenhouse gas, at a time when global climate change is threatening the very fabric of life, order, and society on Earth. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Marilyn Centoni, Redwood City CA 94063

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

STOP POLLUTION OF THE EARTH

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's

why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Bruce Jackson, Oxnard CA 93033

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

- FIX THE 3 INCH PIPE THAT IS LEAKING FROM THIS FACILITY STARTING ON 7/6/16, DO IT QUICKLY!!!!!!!!!!!!!!

Thank you for your consideration.

From: Duane Welsch, Claremont CA 91711

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

- FIX THE 3 INCH PIPE THAT IS LEAKING FROM THIS FACILITY STARTING ON 7/6/16, DO IT QUICKLY!!!!!!!!!!!!

Thank you for your consideration.

From: Lauren Meredith, San Francisco CA 94121

I'm deeply concerned about the impact of methane from the energy sector on climate change. The cost of climate change, when accounting for threats to public health, lost crops, droughts, wildfires, lost biodiversity, armed conflicts, lost infrastructure and so much more is already projected to be astronomical, and we should do all we can to avoid the worst.

So, I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Trisha Lotus, Eureka CA 95501

I appreciate that the Air Resources Board is developing critically important rules to address methane pollution from the oil and gas industry in California, and I urge the agency to quickly finalize these safeguards.

There must be immediate and complete implementation of these new protections in order to make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Bonnie Macraith, Arcata CA 95521

Please act quickly to finalize the strongest possible safeguards to protect our communities and our climate from the oil and gas industry's toxic methane pollution.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Wise Wise, Sunnyvale CA 94086

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's

why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

I am sick and tired of the oil and gas companies externalizing their costs by making the public pay for their pollution. They must bear all the costs of producing their products in a safe, clean, and responsible manner.

Thank you for your consideration.

From: Ann Carranza, Healdsburg CA 95448

I write to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Laura Neish, Santa Rosa CA 95405

I appreciate that the Air Resources Board developed sturdy rules to reduce methane pollution from the oil and gas industry in California, and ask you to quickly finalize these safeguards.

It is time to rein in excessive methane pollution from drilling and fracking, and time to address new and existing sources, both onshore and offshore and to monitor storage sites.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Barbara Hill, Chico CA 95928

This is vitally important! I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: David Coleman, Cobb CA 95426

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. David Coleman

From: Mary Snyder, Arcadia CA 91006

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's

why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Andre Tarverdians, San Diego CA 92120

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

I'm including this line to indicate that I'm a real person and that this issue is important to me.

Thank you for your consideration.

From: Richard Ryon, Fish Camp CA 93623

Thanks to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California. I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Martin Iseri, Fair Oaks CA 95628

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and

urge the Air Resources Board to implement the strongest rules possible without delay. Don't wait a moment longer, please.

Thank you for your consideration.

From: Wren Osborn, El Cajun CA 92020

I'm want to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Roderick Repke, Oakland CA 94602

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Ellen Gachesa, Napa CA 94558

It's about time the Air Resources Board developed necessary rules to address methane pollution from the oil and gas industry in California, which has gotten away with wanton disregard for our environment while raking in obscene amounts of money. The agency must act quickly to finalize these critical rules.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The incredibly massive, nearly four-month-long methane leak in Porter Ranch was not only completely repulsive, but a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Susan Harman, Oakland CA 94619

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Actually, you need to pass regulations today to keep ALL the remaining gas and oil in the ground.

Thank you for your consideration.

From: Jay Heidebrecht, Torrance CA 90503

I want to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Judy Lukasiewicz, Santa Cruz CA 95065

I wish to thank the Air Resources Board for developing critically important standards to address methane pollution from the oil and gas industry in California. Now it is time to quickly finalize these safeguards.

Full implementation of these new protections are going to make California a national leader with regard to reining in out-of-control methane pollution from the obsolete oil and gas industry, and help to increase public safety in California. Addressing both new and existing sources, addressing onshore and offshore oil industry infrastructure, as well as setting monitoring standards for natural gas storage sites such as Aliso Canyon, are all important steps in the right direction for our shared environment, and, as implemented, will help to reduce the enormous, negative impact that oil procurement and use has had on California and the world. The comprehensive scope of these rules will help us avoid many of the ultimately dangerous loopholes and weaknesses of other state and federal standards.

In addition to ensuring that these rules aren't weakened in any way, I request that the Air Resources Board strengthen the following provisions:

- Require operators to REGULARLY find and fix leaks;
- Remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do NOT exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the important value of clearly reducing pollution from oil and gas industry interests in California communities, including greatly reducing any human and/or environmental exposure (land, air, water) to toxins from oil extraction methods.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call exposing the lax regulation of existing oil and gas facilities, and alerting Californians, and the nation, to the fact that these facilities for methane storage are an immediate threat to our health and our climate. It's time to move away from fracking, methane use/storage, and from the use of gas/oil. Ultimately, It is time to more quickly move away from fossil fuel use in America and globally. In the mean time, strong safety rules and precautions are needed to protect life from the ravages of fossil fuel procurement and use.

Overall, I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you.

From: Michelle Skinner, Guerneville CA 95446

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you, Michelle Skinner-

From: Laura Peck, Indio CA 92201

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

I believe these points are of critical concern.

Thank you for your consideration.

From: Bill Martin, Quincy CA 95971

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

We should not preserve old line business models that help ruin the environment. Profit cannot be allowed to trump preservation of our health and environment. Renewable alternatives to methane combustion abound and we should use them.

Thank you for your consideration.

From: Glenda Poliner, San Diego CA 92131

I joined the group of 20 activists who risked arrest at the Porter Ranch Natural Gas storage facility on May 15, 2016. Numerous residents arrived at the site to thank us for our action. As a seventh grade teacher, I was particularly concerned by the words of a resident of Porter Ranch who is a fifth grade teacher and said that 80% of her students were physically sickened by the leak. We must prevent this from occurring again.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules --

including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

Glenda Poliner

From: Anne Wolf, Santa Rosa CA 95405

I thank the Air Resources Board for developing rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would protect our citizens from methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

Please do not weaken these rules in any way, The oil and gas industry are fighting to keep the status quo but our citizens should not endure months of methane pollution. California and the western states have experienced a long drought brought on partly by the burning and pollution of fossil fuels. As a state and nation, we need to take steps to slow down climate change to save our forest, our farms, our water supply and in turn our businesses and homes.

I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Belinda Kein, San Diego CA 92109

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

It's time to put the health and welfare of people before industry!

Thank you for your
consideration.

—

From: Siddharth Mehrotra, Camarillo CA 93010

I herein thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly confirm these. In addition, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

Thank you for your consideration.

From: Kathleen Gordon, Dana Point CA 92629

This is a No-Brainer. This can no longer be ignored. We must stop turning a blind eye. It's far past time for major changes in protecting our environment. I can't fathom how the special interest money mongers look at themselves in the mirror. In the grand scheme of things is the almighty \$ really all that important?

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Luis Lozano, Long Beach CA 90803

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Regulations are meant to be tough and enforceable and protect the health and environment. There can be no compromise.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Janet Westbrook, Ridgecrest CA 93556

I want to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards, before the election.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's

why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your
consideration.

—

From: Jonathan Baty, Redlands CA 92373

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration and rapid action on this critical need.

From: Linda Larkin, Santa Cruz CA 95060

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay and with no compromises that would weaken these safeguards.

Thank you for your
consideration.

—

From: Mary Ames, Temecula CA 92592

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in curbing out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules avoids many of the loopholes and weaknesses of other state and federal standards, including the fact that they address both new and existing sources, both onshore and offshore infrastructure, and set monitoring standards for natural gas storage sites like the Aliso Canyon facility.

I urge the Air Resources Board to ensure that these rules aren't weakened in any way, and, In addition, to strengthen a few provisions, specifically:

- By requiring operators to find and fix leaks on a periodic basis, and to remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- By not exempting sources of methane such as low-bleed pneumatics;
- By Ensuring that agency cost estimates take into account the value of reducing pollution from the oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a warning that failure to maintain strict regulatory standards for existing oil and gas facilities seriously threatens our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Billz Iams, San Jose CA 95132

Living in a MadMax future world of poison everywhere is not for me or my family. VIVE

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Christine Hoffman, Berkeley CA 94705

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to make sure the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: David Kent, Windsor CA 95492

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. Sincerely, David Kent

From: Jan Walton, Alameda CA 94502

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Clean up as much as possible please! Give us a cleaner healthier future.

Thank you for your consideration.

From: Pat Marriott, Los Altos CA 94024

Thank you for developing important rules to address methane pollution from the oil and gas industry in California. Please finalize them ASAP.

If you do, California will be a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Barbara Mauz, Los Angeles CA 90064

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay. After all, these are the reasons for this Board's existence!

Thank you,

Barbara Mauz, Los Angeles, CA 90064

From: Marcy Vincent, Rancho Palos Verdes CA 90275

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources and onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

In addition to ensuring that these rules are not weakened in any way, I urge the Air Resources Board to strengthen a few provisions:

- Require operators to regularly find and fix leaks, and remove the provision that allows operators to "step-down" from quarterly to annual inspections depending on whether or not they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from the oil and gas industry in California communities, including reducing exposure to toxic substances.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake-up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. Please act quickly.

From: R. Shandor, San Diego CA 92110

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

- Set the levels of fines for breaking or ignoring safeguard rules to be prohibitive enough to ensure that it makes more financial sense to comply with the rules, than it does breaking or ignoring them.] OP-9-6

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Charles Wolfe, Sylmar CA 91342

As one who suffers greatly from the effects of air pollution, I am writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Joel Isaacson, Berkeley CA 94709

I thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Ann Gallon, Bakersfield CA 93314

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

I live in Kern County, home to most of the oil activity in California. I've seen FLIR camera footage of VOCs escaping from oil industry tanks right next to school playgrounds. Thank you for new rules that will protect our health and the health of children.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Ronald & Donna Thompson, Crescent City CA 95531

We're writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, we urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: A.J. Averett, La Mesa CA 91942

My sincere thanks to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California; I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in frequently overlooked and out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon in the San Fernando Valley -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen some provisions, in particular:

- Require operators to regularly search for and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they in fact find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak at Porter Ranch was a wake-up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate.

Again, I fully support these new safeguards -- and urge the Air Resources Board to implement the strongest rules possible as quickly as possible.

Thank you.

From: F Hammer, San Francisco CA 94123

Thank you to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and for urging the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Rochelle Grober, San Jose CA 95126

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

I also hope you will address the oil refinery practice of flaring and institute progressively more stringent controls to eventually replace the practice with a more environmentally sensitive solution.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Howard Miller, Ventura CA 93003

Thank you and please keep acting strongly to protect our environment from methane to save the livability of our only home, earth !!!!!!!

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's

why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Virginia Smedberg, Palo Alto CA 94301

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Please consider the value of lives of citizens as much more important than the profits of the industry!

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: David L. Ely, Saugus CA 91350

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules - including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon - avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Naomi Quinones, Berkeley CA 94704

Thank you for developing critically important rules to address methane pollution. Please also quickly finalize these safeguards and ensure they are not weakened in any way.

From: Annette Bork, Irvine CA 92612

I want to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Robert Biehl, San Diego CA 92117

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

No more sweetheart deals for fossil fuel companies which are destroying our country, our democracy and our health all in the name of their increased profit. Enough! No more fossil fuel deals.

Thank you for your consideration.

From: Chris Eaton, Tujunga CA 91042

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

We will continue to defeat our attempts to reverse climate change as long as Methane release is not addressed. Energy producers and suppliers need to be more concerned with the damage they do to our world instead of looking only at their bottom line.

Thank you for your consideration.

From: David Miller, Irvine CA 92612

Thank you, Air Resources Board, for developing critically important rules to address methane pollution from the oil and gas industry in California. I now urge The Board to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules ? including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon ? avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I ask that the Air Resources Board strengthen a few provisions, namely:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake-up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: David Ross, San Francisco CA 94133

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

The absurdity of that Porter Ranch leak and venting burn-offs seen at nearly every refinery is that the methane and other flammable gases could be compressed and used with controlled burns to generate electricity, instead of wasting it and polluting the air.

Thank you for your consideration.

From: Mary Ann McDonald, Sacramento CA 95842

I'm writing to both thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

With full implementation of these new protections, California will be a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- addressing both new and existing sources, onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Charles M. Bailey, Jr., Daly City CA 94015

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules - including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Mary O'Brien, Sacramento CA 95842

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. Because I have asthma, and others in my family do also, I am particularly aware of air pollution issues, and have a greater stake in having these issues solved. Because people and animals need to breathe, and to have a livable climate, it is extremely important to curtail air pollution as quickly as possible, and accept no excuses! Nothing is more important than clean air and water and healthy soil to grow crops. No amount of pollution is safe and healthy. We can't just settle for small improvements. The future of our planet and all life on it are at stake. Keep it in the ground.

From: Maggie Nebout, Los Angeles CA 90017

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

This is a crucial step and a crucial time

Thank you for your consideration.

From: James Michael Kelly, Huntington Beach CA 92648

As American citizens and residents of California, we do not owe the oil and gas billionaires our air, water and lands. If these fossil fuel billionaires cannot extract our California resources safely, then they need to move to some tea bagger state where the people do not care what poisons their families are exposed to.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: V and B Jones, Torrance CA 90508

Thank you Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, we urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why we support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Marya Zlatnik, Millbrae CA 94030

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

As a doctor who cares for pregnant women, I am concerned about the impacts of this pollution on global warming and the risk of preterm birth, a major cause of death and disability for babies.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Zelma Fishman, Los Osos CA 93402

Please, we don't need any more methane.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Heather Brophy, Santa Barbara CA 93109

WE PAY YOU SO GET GOING,NOW! I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Kae Bender, Lancaster CA 93536

As a Californian with asthma, I already suffer from the dirty air. As a resident of LA County, I urge you on the Air Resources Board to stick with developing critically important rules to address methane pollution from the oil and gas industry in California.

It is important to stand up to the industry who want to limit rules and for the citizens who need this protect. I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Deborah Alexzander, Castro Valley CA 94546

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

IT IS TIME WE LEGISLATE "PEOPLE AND OUR PLANET FIRST BEFORE ANY CORPORATION'S PROFIT. FOR YEARS WE CITIZENS HAS "SUPPLEMENTED FOSSIL FUELS" AND FRANKLY I DON'T KNOW WHY. HOWEVER HOLDING ANY AND ALL POLLUTING ,FOSSIL FUEL CORPORATION "RESPONSIBLE FOR THE HARM THEY DO AND HAVE BEEN DOING FOR DECADES" IT LONG OVER DUE AND THE ONLY WAY WE "SIMPLE AMERICANS" CAN HOLD THEIR FEET TO THE FIRE AND STOP THEIR POLLUTION AND SAVE LIVES AND MOST IMPORTANTLY PUT OUR PLANET AND CLIMATE FIRST OVER THE WISHES OF FOSSIL FUEL PRODUCERS. THEY WON'T DO IT SO WE NEED OUR ELECTED OFFICIALS TO PUT AN END TO THEIR "DEADLY WASTE BY-PRODUCTS AS WELL AS THEIR PRODUCTS" AND PROTECT OUR PLANET.

I LOOK FORWARD TO THE DAY WHEN WE ALL HAVE FREE SOLAR ENERGY TO HEAT AND COOL OUR HOMES AND BUSINESSES AND FUEL OUR CARS.

WE HAVE THE TECHNOLOGY NOW, AND WE'VE HAD IT FOR QUITE SOMETIME BUT THE FOSSIL FUEL PRODUCERS HAVE BLOCKED ANY REAL ADVANCEMENT VIA THEIR LOBBIESTS AND AND UNFORTUNATELY OUR ELECTED "LEADERS".

LET'S REALLY MAKE A DIFFERENCE AND AFTER WE STOP THIS PARTICULAR PRACTICE LET'S MOVE ON TO HELP ADD MORE JOBS VIA CLEAN, RENEWABLE ENERGY AND SAVE OUR PLANET TOO! WHAT A REVELATION!!!

Thank you for your consideration. DEBORAH ALEXZANDER

From: T Cassidy, Clovis CA 93611

Methane in particular apparently has not been integrated into CO2 concentrations in models generally predicting varying levels of climate change. Methane works more quickly than geologic time scales in adding to CO2 effects such that it may be the catalyst to tip the outcomes from gradual climate change, which may be mitigated, to abrupt catastrophic climate change.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Angelo Cohen, El Cerrito CA 94530

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Remember, the greedy interests of industry represent a conflict of interest with biological health. It's about time that a change in strategy be implemented. Industries have to go through radical reform for the health of our future, instead of people having to go through radical reform to cope with the toxicity.

Thank you for your consideration.

From: George Selkirk, Carmichael CA 95608

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Are a few shut off valves too much to ask for?

Thank you for your consideration.

From: Jennifer Patterson, Aptos CA 95003

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon - avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Nancy Miller, Santa Maria CA 93455

Continue to do the right thing.

Thank you for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Deborah Kennedy, San Jose CA 95126

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Please help protect wildlife and our children today.

Thank you for your consideration.

From: Debra Lono, Hayfork CA 96041

I'm wrniting to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate.

Thank you for your consideration.

From: Mark Knowles, Los Angeles CA 90027

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

I'd also like you seriously look into methane & greenhouse gasses that are emitted by the Beef & Dairy industries, and the high cost to the environment during it's overall production.

OP-9-8

Thank you for your consideration.

From: Mark Feldman, Santa Rosa CA 95401

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to QUICKLY FINALIZE THESE METHANE SAFEGUARDS.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules --

including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Sandra and Kenneth Garber, Petaluma CA 94952

We thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, We urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Janet Monfredini, San Francisco CA 94131

This is important!! I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Jennifer Taylor, Arcata CA 95521

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Furthermore, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's

why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Matthew Reid, Calistoga CA 94515

I thank the Air Resources Board for developing critically important rules addressing methane pollution from the oil and gas industry in California. Please act quickly to finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Peter Wong, San Francisco CA 94131

The Air Resources Board deserves my thanks for developing critically important rules to address methane pollution from the oil and gas industry in California. Now the agency needs to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Colleen Cabot, San Jose CA 95132

Thanks to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California! I urge the agency to quickly finalize these safeguards.

The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Carolyn Lilly, San Diego CA 92120

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

Please for a better future for our people.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Barbara Demeter, Mill Valley CA 94942

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxins.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake-up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: David Woods, San Lorenzo CA 94580

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

In addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxic substances.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate.

Thank you for your consideration.

From: David Bezanson, San Bruno CA 94066

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Also, to further decrease methane, impose taxes on products of the livestock industry. Ruminants, like bovine species, expel methane daily. This is only one of the environmentally destructive effects of the livestock industry. In contrast, raising crops exerts a much smaller environmental impact and use of resources.

OP-9-9

Thank you for your consideration.

From: Celia Kutcher, Capistrano Beach CA 92624

Thank you to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, please strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

Thank you for your consideration.

From: Jan Summers, Sacramento CA 95825

I'm writing to URGE the Air Resources Board to continue to develop critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

FULL implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

IN ADDITION, to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- 1. Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- 2. Do not exempt sources of methane such as low-bleed pneumatics;
- 3. Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Joyce Cochran, San Francisco CA 94118

Why is this urgent? The passage-of-time without enacting these safeguards causes irreversible harm to our Health and to our Earth. We citizens DESERVE protection against these deadly pollutants.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Thomas Proett, Valley Springs CA 95252

I'm writing to thank the Air Resources Board for developing important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards. Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Renee Cosutta, Sierra Madre CA 91024

I thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

In addition to ensuring that these rules aren't weakened, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics, and our commitment to greenhouse gas emissions.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. So I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Paul Cofrancesco, San Diego CA 92102

I can't believe this is really happening!

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Carol Ehrhardt, Pebble Beach CA 93953

The oil and gas industry should not be writing laws which allow them to pollute the air and soil. It is time our laws protected us, the citizens of this state and this country. These laws should be tough so they can not be challenged by the oil and gas industries.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Lawrence Thompson, Livermore CA 94550

I thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the Air Resources Board to strengthen a few provisions, including:

- (a) Ensuring that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.
- (b) Requiring operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks.
- (c) Not exempting sources of methane such as low-bleed pneumatics.

I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

From: Jill Ballard, Solvang CA 93463

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. But ... is anyone really reading this?

From: K Martin & Elizabeth Stevenson, Santa Barbara CA 93111

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Mary Fitzgerald, Pasadena CA 91109

As a public school teacher and grandparent, I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Martin Katz, Canoga Park CA 91304

I'm writing to thank the Air Resources Board for developing critically important rules to address pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

I urge the Air Resources Board to include action on all releases of pollutants from fossil fuel mining, processing, and distribution. It is important to include testing for other volatile organic compounds as well as methane. These include ethane, propane, carbon monoxide, and sulfur containing compounds.

OP-9-10

Because of the danger presented by any VOC leak, a campaign to educate the public about how to spot leaks under their lawns and gardens (blackened soil over pipes) and to call their natural gas supplier if a leak is suspected. This campaign should be repeated at least once every five years.

In addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of VOCs such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxins. Please also include the value of the VOCs that are being lost.

Thank you for your consideration.

From: Joseph Kasper, Lewiston CA 96052

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

I reiterate, the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. The CAR as well as EPA are established specifically because industry is proven to be incapable of acting in a responsible manner concerning our health and the environment. The environment after all is us. We breathe it, drink it and eat it, and our organs distribute it to all parts of our bodies. We can only be as healthy as the air, water and food that we consume.

Thank you for your consideration.

From: R St. Angelo, Cloverdale CA 95425

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Eileen Carey, Graton CA 95444

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay. i am vehemently AGAINST FRACKING!!! This kind of archaic NON sense MUST stop NOW ; not 10 years from this point; but NOW... it is ABSOLUTELY insane that we are not implementing more sustainable ways of caring for our ONLY Earth & Sky ..it is so wrong & SO illogical .

Thank you for your consideration.

From: Les Amer, North Hollywood CA 91606

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Harry Knapp, Riverside CA 92507

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. also BAN FRACKING IN cALIFORNIA

From: Kathryn Carroll, Oakland CA 94611

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.
Kathryn Carroll

From: James Massie, Alameda CA 94501

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Daniel Dobson, Placentia CA 92870

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

P.S. -- Thank you for your work protecting California (my state) and I urge you in the strongest possible terms to continue protecting us by strongly safeguarding us from methane pollution from the oil and gas industry.

From: Rebecca Montgomery, Santa Rosa CA 95405

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air

Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Besides, if they think they're being over-regulated, will they take their business elsewhere?

Thank you for your consideration.

From: Tamar Wherrit, Mount Shasta CA 96067

Oh, I love it when I get to write a thank you! So I'm pleased to be able to write to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your thoughtful consideration.

From: Robert Stephenson, Oakland CA 94609

Thanks to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Lois Hutchinson, Los Angeles CA 90025

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxins.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Rachel Denny, Bradley CA 93426

I am taking this opportunity to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Sally Picciotto, Oakland CA 94611

As an environmental epidemiologist and proud Californian, I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Greg Cover, Oakland CA 94611

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Let's get this done!

Thank you for your consideration.

From: Bruce Coston, Sunnyvale CA 94087

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to

"step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.
Stop the insanity.

Thank you for your consideration.

From: Katharine Owens, Grass Valley CA 95949

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.
- Current and new industry companies must submit full safety plans and ability to remediate any leaks or spills and post bonds to pay for the remediation.

OP-9-11

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Elaine Benjamin, Alpine CA 91901

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

Elaine Benjamin

From: Marilyn Davey, Oceanside CA 92056

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. .

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Beverly Harris, Red Bluff CA 96080

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

I believe all fracking causes methane leaks and therefore support an end to fracking. But, in the meantime, these protections should be in place for all wells.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Kathy Sabatini, Fair Oaks CA 95628

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California and I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Gary Lasky, Fresno CA 93704

Thank you for developing critically important rules to address methane pollution from the oil and gas industry in California; please quickly finalize these safeguards.

Please keep these rules strong and make a few provisions stronger still:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from the oil and gas industry in California communities, including reducing exposure to toxics.

We urge the ARB to implement the strongest rules possible without delay.

Thank you. We are counting on you. (We live in Tulare County, which is often rated as having the worst air quality in the nation.)

From: Shoshona Crellin-Quick, Santa Rosa CA 95404

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules ? including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon ? avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Loraine Lundquist, Northridge CA 91343

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

As a resident of Northridge, not far from the Aliso Canyon climate disaster, I urge you to protect our communities from the damaging methane pollution we have been experiencing.

Full implementation of the new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Rod Repp, Baldwin Park CA 91706

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the

loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. Rod Repp

From: Paul and Kathleen Lanctot, Santa Cruz CA 95066

We are writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, we want the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why we support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Michael Pelizzari, Milpitas CA 95035

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That one leak erased all of California's progress toward zero carbon emissions achieved by its solar and wind farms. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Daniel Williams, Yosemite National Park CA 95389

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

The most important thing we can do to secure a healthy future for our citizens is to control to the utmost these hazardous and toxic materials. If the industry cannot or will not do it themselves, we must, through our government, take the matter in hand.

Thank you for your consideration.

From: Paulette Schindele, San Marcos CA 92069

I agree wholeheartedly with the following statement from Sierra Club:

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Susan Quan, Berkeley CA 94705

Thank you to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California. I also urge you to quickly finalize these safeguards.

Full implementation of these new protections makes California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and

setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Gary Allen, San Francisco CA 94114

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards. Methane is dangerous in so many different ways that it would be foolish to take any shortcuts in our system of management of and protection from this gas.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Gail Marie Noon, San Pedro CA 90731

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Kristine Andarmani, Saratoga CA 95070

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas

industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your time and consideration.

From: Elizabeth Edinger, North Hollywood CA 91601

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources and both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Requiring operators to regularly find and fix leaks, and removing the provision allowing operators to "step-down" from quarterly to annual inspections, depending on whether they find leaks;
- Not exempting sources of methane such as low-bleed pneumatics;
- Ensuring that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake-up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Rose Ann Witt, Westlake Village CA 91362

I'm writing as a biologist, mother and resident of Thousand Oaks (which is just west of Porter Ranch) to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Tom Hazelleaf, Seal Beach CA 90740

I thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in the control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

I do urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from the oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you.

From: Pat Wolff, Arcadia CA 91066

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the

loopholes and weaknesses of other state and federal standards.

I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Emily Moran, Merced CA 95340

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxic compounds.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Xhen Bioa, San Francisco CA 94109

I am wondering why the righteous Gov Brown sat on his hands and did nothing all the while his SISTER IS INVOLVED in this industry?! o wait a moment - she is protected species she is high level elite

Screw her and gov brown + family for not standing up immediately to stop that disaster

During that time the community underwent severe trauma that should not have continued as it did - but corporations whether run by left or right will do as they please because they have the Blessing of the government

But we all know of other communities that are impacted by such yet no one cares

Thank you for your consideration.

From: Ruthie Loeffelbein, Placerville CA 95667

I thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

We need full implementation of these new protections, which avoid many of the loopholes and weaknesses of other state and federal standards.

In addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

I support the new safeguards and the above-proposed improvements and urge the Air Resources Board to implement strong rules without delay.

Thank you for hearing me.

From: Robert Raven, Novato CA 94945

Protect our health and climate!

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Cindi Darling, Fairfax CA 94930

I'm writing to urge the Air Resources Board to quickly finalize the critically important rules to address methane pollution from the oil and gas industry in California.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Alex & Natalie Neal, Cardiff by the Sea CA 92007

We are writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Shirley Black, Santa Rosa CA 95409

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Please, we must think and take action to protect against the short term greed of corporations and individuals. We, thinking, caring people, must protect our environment and our planet from short term thinking and profits.

Thank you for your consideration.

From: Dennis & Ingeborg Ely, Los Gatos CA 95030

We're writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, we strongly urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

We sincerely thank you for your consideration.

From: Marsue Evans, San Diego CA 92116

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly lize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Bill Connor, Cupertino CA 95014

An unsafe storage system spews methane in massive amounts into our air, now is the time to fix it. I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Ara Marderosian, Weldon CA 93283

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the

loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

In addition, the Board must assess the impacts to climate change and the drought from the even worse methane pollution source in California that is created by the production and consumption of cattle feed, which represents approximately 55% of California's methane production. Also see: http://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname=slcp2016&comment_num=73&virt_num=66 AND http://www.arb.ca.gov/lispub/comm/bccomdisp.php?listname=slcp2016&comment_num=9&virt_num=8 OP-9-12

Thank you for your consideration.

From: Debbie Notkin, Oakland CA 94609

I hope the Air Resources Board will quickly finalize its strong methane control recommendations.

California often leads the country in environmental actions, and controlling methane pollution will be a crucial next step. I really appreciate the comprehensive content of the proposed rules. I am counting on you not to weaken them, and I hope you will make some strengthening changes as well, including:

- requiring operators to regularly find and fix leaks
- removing the provision allowing operators to "step-down" from quarterly to annual inspections if leaks are not found
- not exempting some sources of methane, including low-bleed pneumatics;
- ensuring that agency cost estimates take into account the value of reducing pollution and toxics

No one needs another Porter Ranch. Please do the right thing quickly.

From: Rick Gaston, Oakland CA 94605

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

If we can't harvest natural gas without large amounts of methane leaking, then it needs to be shut down completely as a transitional source of energy until carbon-free sources are more readily available.

Thank you for your consideration.

From: Jennifer Hollesen, Fresno CA 93704

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxins.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax

regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Rex Benning, Santa Clara CA 95050

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

This is critical for us and future generations.

Thank you for your consideration.

From: Esther Thomas, Whittier CA 90604

I'm grateful to the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and am writing this to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to

"step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Julie Kolankowski, San Mateo CA 94402

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay. IF ANY BODY SHOULD GET SICK THEY COVER THE COSTS OF THE DOCTOR. THEY SHUT DOWN AND HAVE THEIR ORGANIZATION INSPECTED FIVE TIMES A YEAR AND WILL COOPERATE FULLY WITH ALL LAWS. IF NOTY YOU PAY BILLIONS IN DAMAGES UNTIL YOU DO.

OP-9-13

Thank you for your consideration.

From: Joseph Zakrzewski, San Francisco CA 94115

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

An ounce of prevention is worth a pound of cure \$\$\$\$. Full implementation of these new protections

would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Paul Jacobson, Willits CA 95490

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Coralie Carraway, Auburn CA 95602

We've seen the dangers first hand in southern California. I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Saran Kirschbaum, Los Angeles CA 90035

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards NOW.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: JP Perino, Novato CA 94945

I'm writing to you to day because of my concern for the need for immediate safeguards to address methane pollution from the oil and gas industry in California. While I appreciate the Air Resources Board for developing critically important rules, we need to quickly finalize these safeguards. As a native Californian, voter and taxpayer, I am critically aware that unless the new California air safety regulations rein in out of control methane pollution from the oil ad gas industry we who breathe air in California are not protected from this invisible menace.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Souri Malkin, Sherman Oaks CA 91403

Millions of us sort our trash every week so we can recycle. Yet THESE safeguards would do so much more!!!!!!!!!!

PLUS: it's not OK to make residents around these areas breathe unsafe air.

Who are we: CHINA??????? WTF????

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-

of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Diane Olson, Santa Monica CA 90403

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

WE NEED EVEN MORE PROTECTION AGAINST POLLUTION FROM THE OIL AND GAS INDUSTRY. KEEP UP THE GOOD WORK AND GIVE US EVEN MORE.

Thank you for your consideration.

From: Jennifer Hansen-Feruch, Fremont CA 94538

I'm writing to demand CA

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support banning now.

Thank you for your consideration.

From: Melissa Bergemann, Los Angeles CA 90291

First off, thank you very much for taking the time to read my letter. I know that you have a very busy schedule, so I really do appreciate.

I'm writing to you today to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in CA, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry.

The comprehensive scope of these rules avoid many loopholes and weaknesses of other state and federal standards.

In ensuring these rules aren't weakened, I urge the Air Resources Board to PLEASE strengthen provisions, including:

- Require operators to regularly find and fix leaks, remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in communities, including reducing exposure to toxics.

The massive 4 month-long methane leak in Porter Ranch was a wake up call that lax regulation of existing oil and gas facilities is a threat to our health and climate.

That's why I support these new safeguards and urge the Air Resources Board to PLEASE implement the strongest rules possible without delay.

Thank you for your consideration.

From: Bill Denneen, Nipomo CA 93444

As a Retired Bio. Prof. I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Jaime Robles, San Leandro CA 94577

I'm writing to thank the Air Resources Board for developing critically important rules that address methane pollution from the oil and gas industry in California. I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax

regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Robert Applebaum, San Jose CA 95135

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch wxas a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Charles Mundy, Cathedral City CA 92234

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to

"step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake-up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Lloyd & Doris Dent, Northridge CA 91324

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

As a resident of Northridge, I still fear the residual effects of the Porter ranch debacle upon my grandchildren living with me.

Thank you for your consideration.

From: Ro LoBianco, Benicia CA 94510

For almost four months last year, massive amounts of methane -- an extremely damaging greenhouse gas -- poured from an out-of-control gas leak near Los Angeles. The leak made people sick, nauseous, and gave local residents nosebleeds. Thousands of residents had to be evacuated, and a state of emergency was declared. Schools had to be be closed. This climate disaster has been called the "BP oil spill on land," and it's easy to understand why.

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, you must also implement the following provisions:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: P C, Sebastopol CA 95472

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

And, why do we not make more use of solar? We are the sunshine state are we not?

From: Cynthia Patrick, Ventura CA 93004

I support the Air Resources Board developing critically important rules to address methane pollution from the oil and gas industry in California and urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

requiring operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

not exempting any sources of methane
ensuring that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

From: Michale Noll, Studio City CA 91604

I would like to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Decker Mcallister, San Francisco CA 94131

To whom it may concern,

Below you will read a form letter that I agree with. That said, I do have an additional point for your consideration. It pertains to the cost to the energy companies. I believe all reasonable costs of detection, monitoring, repair, replacement programs (including the required work hours to plan, implement, & continue said programs and the actions to carry them out) are reasonable costs of business. We need to include this in our legislation and publicize California's pragmatic approach to the intersection of climate and business. Thank you in advance for your consideration.

OP-9-14

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Roxanne Fand, Oceanside CA 92056

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for taking action.

From: Chris Miilu, Chico CA 95928

Thank you, Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and for urging the agency to quickly finalize these safeguards.

California has always been a national leader in reining in out-of-control pollution from the oil and gas industry. The comprehensive scope of these rules address both new and existing sources, onshore and offshore infrastructure; it sets monitoring standards for natural gas storage sites like Aliso Canyon; it avoids many of the loopholes and weaknesses of other state and federal standards.

Let's keep California in the forefront of anti-pollution measures. PG&E was allowed to pollute up in Mendocino County years ago; they were stopped. Stop them again.

I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax

regulation of existing oil and gas facilities is an immediate threat to our health and our climate.

I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Claudia Gibson, Fairfax CA 94930

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

No coal trains & no oil trains! People first!!

Thank you for your consideration.

From: Joanne Angvick, Pleasanton CA 94588

I thank the Air Resources Board for developing important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Sharon Morris, Hayward CA 94541

Thank you, Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California. Now, please quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules, including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon avoid many of the loopholes and weaknesses of other state and federal standards.

In addition to ensuring that these rules aren't weakened in any way, please strengthen a few of the provisions, including:

- Requiring operators to regularly find and fix leaks, and removing the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether or not they find leaks;
- Not exempting sources of methane such as low-bleed pneumatics;
- Ensuring that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake- up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and request the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Michael Recht, Torrance CA 90505

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air

Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Please stand with the people and not the industry

Thank you for your consideration.

Michael Recht, PhD

From: Ute and Loren Lee, Los Angeles CA 90029

We're writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, we urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Robert Rusky, San Francisco CA 94114

The Air Resources Board has acted properly and responsibly in developing critically important rules to address methane pollution from the oil and gas industry in California. I urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities poses a present and ongoing threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Peggy Herricks, La Mirada CA 90638

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration. Pollution kills people and animals.

From: Catherine Fowler, Madera CA 93636

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Methane pollution from the oil and gas industry needs to be stopped immediately. Not only is it wasteful, but it also raises ozone levels considerably.

I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate.

Thank you for your consideration.

From: John D. Stickle D.C., Cloverdale CA 95425

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I write to strongly urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the incredible and dangerous lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. The oil and gas industry simply should not be allowed to use our air as a garbage dump. Methane is one the worst polluters of the air known. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration of my comments.

From: Barbara Whipperman, Richmond CA 94805

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Remember, History Is Watching You!

Thank you for your consideration.

From: Leon Van Steen, San Francisco CA 94134

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

From: Susanne DeWitt, Berkeley CA 94708

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;

- Do not exempt sources of methane such as low-bleed pneumatics;

- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

Thank you for your consideration.

Susanne DeWitt

From: Richard Nielson, Los Osos CA 93402

I'm writing to thank the Air Resources Board for developing critically important rules to address methane pollution from the oil and gas industry in California, and to urge the agency to quickly finalize these safeguards.

Full implementation of these new protections would make California a national leader in reining in out-of-control methane pollution from the oil and gas industry. The comprehensive scope of these rules -- including addressing both new and existing sources, both onshore and offshore infrastructure, and setting monitoring standards for natural gas storage sites like Aliso Canyon -- avoid many of the loopholes and weaknesses of other state and federal standards.

However, in addition to ensuring that these rules aren't weakened in any way, I urge the Air

Resources Board to strengthen a few provisions, including:

- Require operators to regularly find and fix leaks, and remove the provision allowing operators to "step-down" from quarterly to annual inspections depending on whether they find leaks;
- Do not exempt sources of methane such as low-bleed pneumatics;
- Ensure that agency cost estimates take into account the value of reducing pollution from oil and gas industry in California communities, including reducing exposure to toxics.

The massive, nearly four-month-long methane leak in Porter Ranch was a wake up call that the lax regulation of existing oil and gas facilities is an immediate threat to our health and our climate. That's why I support these new safeguards and urge the Air Resources Board to implement the strongest rules possible without delay.

And, EXACTLY Who is at Fault?

Also, WHO is PAYING ALL PERILS?

Thank you for your consideration.



Western States Petroleum Association
Credible Solutions • Responsive Service • Since 1907

Catherine Reheis-Boyd

President

July 18, 2016

Mr. Jim Nyarady
Manager, Oil and Gas Section
California Air Resources Control Board
1001 I Street
Sacramento, CA 95814

via e-mail at: jim.nyarady@arb.ca.gov

Re: WSPA Comments on draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Operations (June 2016)

Dear Jim:

The Western States Petroleum Association (WSPA) is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in California and four other western states. WSPA appreciates this opportunity to provide comments on the proposed regulatory language published by the California Air Resources Board (ARB) on June 2, 2016 regarding ARB's draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Operations.

WSPA and WSPA member companies, as key stakeholders, have engaged with the ARB in the regulation development and implementation process. As the WSPA member companies each have existing air quality compliance programs, it is important that the final regulation be consistent with current and successful local, state, and federal air quality regulations.

OP-10-1

After careful review of the latest draft language, WSPA's main concerns involve the sections concerning:
1. Gauge Tanks; 2. Circulation Tanks; 3. LDAR; and 4. Definitions.

1. Gauge tanks, which are used to gauge the productivity of a well, have not been in any of the previous versions of the rule. WSPA is concerned with the last minute addition and the lack of feasibility studies and economic analysis of vapor recovery requirements on these tanks.
2. WSPA still believes there is not a full understanding of the circulation tank operations. Some of the requirements are not safe and are technologically or economically infeasible. Although there has been deadline extensions provided, since the technology for 95% control efficiency does not exist, WSPA believes the manufacturers of the control technologies cannot meet even the later deadline.

OP-10-2

OP-10-3

The rule does not allow the flexibility to perform well stimulations in the future if we cannot find technologically feasible control methods. This section could require us to expend significant time, effort, and money to conduct and report on an investigation that could all be rejected because ARB does not agree with the methods used or if it does not produce desirable results.

Related to that is the infeasibility of not being able to use supplemental gas to support complete combustion of non-combustible gases.

OP-10-3 cont.

3. Expansion of LDAR program will result in two sets of inspections, two sets of programs and recordkeeping – one for the APCD and one for the ARB – since the programs differ so much in the details that affect implementation. Also, as currently written LDAR will be required for systems that in practical application do not have the potential to emit methane. We expect the cost will be significantly more than estimated by ARB and difficulty in finding enough competent contractors to perform and correctly document inspections.

OP-10-4

4. Several definitions need clarity, specifically related to Tank and Separator Systems which may result control requirements on equipment that cannot be controlled, or at least not cost effectively (such as sumps).

OP-10-5

The following attachments provide assessments of WSPA and WSPA member company concerns regarding the proposed regulatory language.

Thank you for your consideration of WSPA's comments. If you have any questions, please contact me at this office, or Jenifer Pitcher of my staff at (661) 321-0884 or email jpitcher@wspa.org.

Sincerely,



cc: Richard Corey, Executive Officer, Air Resources Board
Ken Harris, Oil & Gas Supervisor, Division Oil, Gas & Geothermal Resources
Jenifer Pitcher, WSPA

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

General Comments

Issue 1: WSPA would like to re-iterate comments previously submitted on February 18, 2016 regarding the global warming potential used in the evaluation of this proposed regulation. Over the course of this regulation development process, ARB has changed the Global Warming Potential (GWP) of Methane from 25¹ (100 year average) which was used in the previous economic impact analysis to 72² (20 year average). Although ARB has discussed this change in the supporting documentation for the proposed rule, this GWP change is not reflected in either the definition or anywhere else in the regulation itself.

OP-10-6

The proposed change is not trivial. Using the 20-yr GWP, which is more than three times the 100-yr GWP, makes the emissions estimates from the regulation appear to be three times the emissions estimates of standard GHG programs like EPA's Greenhouse Gas Reporting Program (GHGRP), California's GHG Mandatory Reporting Regulation (MRR), and California's Cap and Trade Program. It also makes the costs for this regulation appear to be three times smaller when compared to other GHG programs.

OP-10-7

A 100-year global warming potential (GWP) value is the current internationally accepted standard used across myriad State and Federal regulatory regimes including the ARB's statewide emissions inventory, AB 32 Scoping Plan and the Cap-and-Trade regulation. The factor change would defeat the internal consistency of the state's policy.

OP-10-8

ARB notes a concern about climate change consequences in 2050 and 2100 – i.e., the 100 year timeframe. Based on this concern, using the 100 year GWP would be more appropriate. The Intergovernmental Panel on Climate Change (IPCC) Report supports both the 100 year and 20 year factors.³ These factors were developed to allow comparisons of different GHGs for policy making purposes, and ARB's revised methodologies will deviate from the standards used by EPA and most other international agencies.

OP-10-9

If ARB insists on choosing the 20 year horizon for methane, then a 20-year horizon for CO₂ would be a fair comparison. In such a comparison, the effect of CO₂ is very small.⁴ As a result California should take the very small radiative forcing of CO₂ into account and reconsider all of its policies with respect to CO₂.

WSPA believes that the lack of a standardized GWP approach between the various AB32 programs is inappropriate, non-transparent and ultimately will cause confusion among stakeholders when comparing the cost-effectiveness and efficiency of the various programs established by ARB and the international community.

OP-10-10

¹ Standardized Regulatory Impact Assessment (April 2015 & June 2016)

² Standardized Regulatory Impact Assessment (April 2015 & June 2016)

³ The IPCC Fifth Assessment Report, Working Group I: The Physical Science Basis, Chapter 8. Figure 8.29

⁴ Ibid.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Recommendation 1: WSPA recommends ARB revise the regulation and use the 100-yr GWP value of 21 for methane (SAR GWP for 100-yr Time Horizon; Table 2.14, IPCC Fourth Assessment Report: Climate Change 2007) to be consistent with other standard GHG programs.

OP-10-11

Issue 2: Currently, Section §95667 does not incorporate a definition of Global Warming Potential of CH₄. This could lead to confusion and several issues during compliance demonstration and enforcement actions. WSPA recommends ARB incorporate the definition of GWP of CH₄ into Section §95667, which will ensure transparency and understanding of compliance requirements for all stakeholders.

Recommendation 2: WSPA requests that ARB add the following term and definition to § 95667.

OP-10-12

"Global warming potential" or "GWP" means the ratio of the time-integrated radiative forcing from the instantaneous release of one kilogram of a trace substance relative to that of one kilogram of a reference gas, i.e., CO₂. For the purposes of this regulation, the GWP of Methane is 21 (SAR GWP for 100-yr Time Horizon; [Table 2.14, IPCC Fourth Assessment Report: Climate Change 2007](#)).

Issue 3: The current cost-effectiveness data provided by ARB in the proposed regulatory package does not include details on impacts for each operator or the assumptions made to determine benefits. Significant variations can exist among operations and/or fields and understanding these variations is important before mandating the proposed requirements on all operations. The same requirement at one location may be cost-effective while another location might be significantly impacted. Therefore, state-wide cost-effectiveness may not represent the actual burden on an operator.

OP-10-13

WSPA (letter dated 5/22/15), California Independent Petroleum Association ([CIPA, letter dated 5/28/15](#)), and Department of Finance ([DOF, letter dated 5/28/15](#)) have pointed out the need for ARB to conduct operator and unit-level cost effectiveness analysis in addition to the state-wide cost-effectiveness of the proposed regulation as outlined below:

- CIPA requested “that staff prepare an updated and detailed economic impact document which clearly shows what the individual impact potential would be on entities” due to concerns regarding the macro-scale view of the SRIA.
- WSPA outlined the significant differences in emission reduction estimates included in the SRIA and reported 2013 MRR data.
- WSPA requested that ARB “provide transparent calculations and unit clarifications that result in a revised cost-effectiveness determination or clear demonstration” of how annual benefits were reached.
- DOF requested that ARB “include the direct cost of each alternative in the SRIA rather than just the overall impacts” and that ARB “discuss how an individual facility’s characteristics, such as emission rates and existing control devices, may affect the calculation of direct costs, and thus economic impacts of the proposed regulations”.

OP-10-14

WSPA believes that it is critical to understand the economic impacts at the unit level (such as at an operator/system level) in order to clearly determine the impact of the regulation. Significant variations can exist between an operator’s emissions, the cost of control, and direct benefits received by the operator.

OP-10-15

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Lack of transparency in unit-level cost-effectiveness and practically low/no applicability thresholds in the proposed regulation will lead to significant adverse impact operators. Unit-level analysis can demonstrate operator-level economic burden, where the most impact will be felt. Additionally, without a reasonable threshold for cost-effectiveness at the unit-level, ARB is assuming the same cost and benefit will occur for all operators.

ARB's response in the staff report to this serious concern is still inadequate. WSPA does not agree with nor support ARB's calculated cost-effectiveness analysis and the basis for many of the proposed regulatory requirements. This is a critical gap in ARB's economic analysis as well as the EA; and needs to be addressed before the rule can be adopted. ARB should minimize regulatory burden for operators where the proposed requirements are clearly not cost-effective and could lead to a significant economic burden for the operator(s).

Recommendation 3: WSPA strongly recommends ARB clearly demonstrate operator and unit-level economic impacts and cost-effectiveness of the thresholds considered for applicability at operator and unit level.

OP-10-15
cont.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

General Definitions

WSPA requests ARB incorporate the following clarifications regarding certain general definitions included in Section §95667 of the proposed regulatory text. The clarity and correctness of the definitions provided are central to all operators' understanding and ability to comply with the regulation. Listed below are some general requested corrections. Additional recommendations for definition changes that provide clarity are included in Attachment A.

Issue 4: *"Emissions" means the discharge of natural gas into the atmosphere.*

- WSPA believes that this definition is inconsistent with the original intent of the rule to control CH₄ emissions.
- ARB's emissions estimates and cost-effectiveness analyses use "MT CH₄" as the basis of the proposed GHG standards.
- Many sections of the proposed regulatory text require a certain percentage of emissions reductions. This will require an operator to demonstrate compliance in terms of a standard unit of measure such as MT CH₄.
- Additionally, Section §95674(c) describes enforcement in terms of "*metric ton of methane*."

However, the definition of emissions states "the discharge of *natural gas* into the atmosphere." The inconsistency in the definition and the rest of the regulation will cause issues not only during compliance demonstration but also for the purposes of enforcement.

Recommendation 4: WSPA requests that ARB clarify this language throughout the regulation in order to provide a consistent and measureable standard. WSPA recommends the following changes:

OP-10-16

"Emissions" means the discharge of ~~methane natural gas~~ into the atmosphere.

"Component" means a valve, fitting, flange, threaded-connection, process drain, stuffing box, pressure-vacuum valve, pipes, seal fluid system, diaphragm, hatch, sight-glass, meter, open-ended line, well casing, ~~natural gas-driven~~ pneumatic device, ~~natural gas-driven~~ pneumatic pump, or ~~natural gas~~ reciprocating compressor rod packing or seal ~~in methane service~~.

"Facility" means any building, structure, or installation to which this subarticle applies and which has the potential to emit ~~natural gas methane~~. Facilities include all buildings, structures, or installations which:

(A) *Are under the same ownership or operation, or which are owned or operated by entities which are under common control;*

(B) *Belong to the same industrial grouping either by virtue of falling within the same two-digit standard industrial classification code or by virtue of being part of a common industrial process, manufacturing process, or connected process involving a common raw material; and,*

(C) *Are located on one or more contiguous or adjacent properties.*

"Vapor collection system" means equipment and components installed on pressure vessels, separators, tanks, or sumps including piping, connections, and flow-inducing devices used to collect and route ~~emissions-methane~~ to a processing, sales gas, or fuel gas system; to a gas disposal well; or to a vapor control device.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Issue 5: WSPA notes that the definition of a sump does not align with other existing regulations.

Recommendation 5: WSPA recommends that ARB align with the definition of a sump as in San Joaquin Valley Air Pollution Control District (SJVAPCD) Rule 4402 as below:

"Sump" means a lined or unlined surface impoundment or excavated depression in the ground ~~that~~which, during normal operations, is in continuous use for separating, ~~store, or hold emulsion,~~ crude oil, condensate, or produced water, and solids in oil producing fields.

OP-10-17

Issue 6: ARB's definition of separator and tank systems includes "sump" as follows –

(54) "Separator and tank system" means the first separator in a crude oil and natural gas production system and any tank or sump connected directly to the first separator.

WSPA is concerned that ARB is requiring additional controls that cannot be safely achieved. Sumps can introduce oxygen into closed loop vapor recovery systems leading to fire and explosion risks. As already stated in the previous letters (dated March 4, 2016), there is no feasible, cost-effective manner by which to capture emissions from a sump, which is not enclosed.

Recommendation 6: WSPA requests that ARB remove the term "sump" from the definition of "separator and tank system." WSPA recommends the following definition for "separator and tank system" –

"Separator and tank system" means the first separator in a crude oil and natural gas production system and any tank ~~or sump~~ connected directly to the first separator.

OP-10-18

Issue 7: ARB's definition of terms "Sump" and "Pond" are overlapping –

"Pond" means an excavation or impoundment for the storage and disposal of produced water and which is not used for crude oil separation or processing.

"Sump" means a lined or unlined surface impoundment or depression in the ground that, during normal operations, is used to separate, store, or hold emulsion, crude oil, condensate, or produced water.

ARB's definitions in Section § 95667 suggest that "Ponds" are subsets of "Sumps" (based on ARB's proposed definitions both could be an impoundment that store produced water, see yellow highlighted text above). However, the control requirements of § 95668(a)(5) and record-keeping requirements of § 95671(a)(1)(A) and (B) and Appendix A Table A1 apply to sumps and ponds differently. The definitions as currently written will not allow an operator to differentiate between a sump and a pond. In addition, the definition of "pond" needs to exclude containment structures, sand separation equipment, and steam blowdown pits. Containment structures are utilized to contain any releases and minimize impacts to the environment. Steam blowdown pits collect condensed steam which will not contain GHG pollutants.

Recommendation 7: WSPA recommends that ARB clarify the definition of the term "Pond" by basing it on the existing and industry-understood definition of Pond in [SJVAPCD Rule 4402](#) as follows –

OP-10-19

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

(42) "Pond" means any very large excavation that is used for the routine storage and or disposal of clean produced water, is not used for the separation of oil and water, and has no more than five percent visible oil-covered surface area. ~~Steam blowdown pits are not ponds. an excavation or impoundment for the storage and disposal of produced water and is not used for crude oil separation or processing.~~

WSPA also recommends that ARB add the definition for the term "clean produced water" defined in [SJVAPCD Rule 4402](#) as follows –

Clean Produced Water: produced water containing less than 35 milligrams per liter of VOCs as determined by EPA Test Method 413.2, 418.1 or 1664A and/or, if necessary, EPA Test Method 8240 or 8260. Ethane, provided the ethane fraction of the hydrocarbon vapors is less than 20 percent by volume, and hydrocarbons heavier than C14 may be excluded from the total concentration. Water samples collected for analysis shall be collected within a five foot radius of the sump inlet. One sample shall be collected near each inlet and the results averaged.

OP-10-19 cont.

Issue 8: ARB's definition of term "Pressure Vessel" is inaccurate.

"Pressure vessel" means any hollow container used to hold gas or liquid and rated, as indicated by an ASME pressure rating stamp, and operated to contain normal working pressures of at least 15 psig without vapor loss to the atmosphere.

Based on ARB's definition in Section § 95667, pressure vessels cannot have vapor loss to the atmosphere. This is not true since all pressure vessels have pressure relief valves for safety purposes. In emergency or upset conditions, pressure relief valves allow release of vapors to balance pressure within the system.

OP-10-20

Recommendation 8: WSPA recommends that ARB correct the definition of the term "Pressure Vessel" as follows –

(47) "Pressure vessel" means any hollow container used to hold gas or liquid and rated, as indicated by an ASME pressure rating stamp, and operated to contain normal working pressures of at least 15 psig without *continuous* vapor loss to the atmosphere.

Issue 9: The proposed regulation has the following definition of vapor control device –

"Vapor control device" means destructive or non-destructive equipment used to control emissions.

The definition of "vapor control device" needs to exclude backup safety devices (e.g. flares) that are used to abate overpressure situations or perform maintenance on equipment.

OP-10-21

Recommendation 9: WSPA recommends that ARB correct the definition of the term "Vapor control device" as follows-

(60) "Vapor control device" means destructive or non-destructive equipment *with the primary purpose* ~~used~~ to control emissions.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Separator and Tank Systems

Issue 10: Section 95668(a)(6) states that “By January 1, 2019, owners or operators of an existing separator or tank system with an annual emission rate greater than 10 metric tons per year of methane shall control the emissions from the separator and tank system and uncontrolled gauge tanks located upstream of the separator and tank system with the use of a vapor collection system as specified in section 95668(c).” (emphasis added).

WSPA is concerned by the inclusion of gauge tanks in section 95668(a)(6) with no notice or discussion of this addition. Section 95668(a)(6) now requires owners or operators of existing separator or tank systems with annual emissions greater than 10 metric tons per year of methane to control emissions from gauge tanks in addition to controlling emission from the separator and tank system. No prior versions of the proposed regulation mentioned gauge tanks nor were gauge tanks discussed with industry prior to this draft being released. In addition, as discussed below, none of the supporting documents provide a compelling reason to include gauge tanks in the regulation and, in fact, most of the supporting documents do not even mention gauge tanks.

WSPA’s understanding was that the vapor collection system would only be required on the primary separator and secondary tank within a separator and tank system. With this understanding, WSPA provided a significant amount of data to assist ARB with estimating and prioritizing emissions from separator and tank systems. ARB’s emissions estimates described in Appendix B of the proposed regulatory package do not include any estimates for gauge tank emissions or costs of control. It appears that this source was added at the last minute without proper cost-effectiveness analysis as required in the Economic Analysis and Standardized Regulatory Impact Assessment (“SRIA”), and without the required environmental analysis under the California Environmental Quality Act (“CEQA”).

WSPA is providing the following data, emissions estimates, and costs related to gauge tanks.

1. **Function:** Gauge tanks are used to test the percent oil and water cut from a single well. In most cases, the test is conducted in automated well testers that are closed loop pressure vessels. In certain heavy oil fields (API Gravity < 20), gauge tanks may be used to conduct the tests of remotely located wells.
2. **Location:** Gauge tanks are located close to wells to enable testing and each tank may be used to test one or more wells. Only one well is tested at any given time.
3. **Frequency of Operation:** Gauge tanks do not operate continuously. Most gauge tanks operate once a week or once every few weeks depending on the throughput of the wells they serve. Wells with low throughputs require less frequent testing. Each test may last an average of 2-4 hrs.
4. **Geographical and Operational Separation:** Although the emissions estimates provided in ARB’s economic analysis do not provide any information on gauge tanks, from recent discussions, WSPA understands that ARB has assumed there are approximately 500 uncontrolled gauge tanks in California. However, according to WSPA’s estimates, members have approximately 200 uncontrolled gauge tanks with capacities ranging from 20 bbl to 200 bbl. As stated above, these tanks are located close to remote heavy oil wells and away from centralized tank farms. There is usually significant geographic separation between gauge tanks and

OP-10-22

OP-10-23

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

separator and tank systems. In addition, gauge tank operations are separate from the operations of separator and tank systems.

5. **Emissions Estimates Not Included in ARB Analysis:** ARB's emissions estimates described in Appendix B and Appendix D do not include any estimates for gauge tank emissions.
6. **Emissions Levels Very Low:** In order to estimate emissions from gauge tanks, WSPA collected member data of a few random flash test samples of gauge tanks. All samples were taken upstream of the gauge tanks. Using this data, WSPA developed average emission factors for methane emissions from gauge tanks in MT CH₄ per barrel of crude oil and MT CH₄ per barrel of produced water. The results are outlined in Table 1 below.

OP-10-23
cont.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Sample ID	Oil Throughput (bbl/yr) ⁵	Average Oil Throughput (bbl/day) ⁶	Water Throughput (bbl/yr) ⁷	Average Water Throughput (bbl/day) ⁸	Duration of Operation (Days/yr) ⁹	Gas to Oil Ratio (scf/bbl) ¹⁰	Gas to Water Ratio (scf/bbl) ¹¹	CH ₄ Mole% in Oil ¹²	CH ₄ Mole% in Water ¹³	MT CH ₄ in Oil ¹⁴	MT CH ₄ in Water ¹⁵	Total MT CH ₄ ¹⁶	Emission Factor MT CH ₄ /bbl Oil ¹⁷	Emission Factor MT CH ₄ /bbl Water ¹⁸
1	29,613	81.1	65,731	180.1	115	1.728	0.370	48.6%	20.4%	0.48	0.10	0.57	0.000016	0.0000014
2	4,905	13.4	126,872	347.6	78	1.118	0.045	45.2%	18.7%	0.05	0.02	0.07	0.000010	0.0000002
3	28,694	78.6	292,785	802.2	166	0.249	0.123	8.0%	2.6%	0.01	0.02	0.03	0.000000	0.0000001
4	3,275	9.0	10,236	28.0	85	0.886	0.886	16.5%	0.0%	0.01	-	0.01	0.000003	-
5	1,360	3.7	4,019	11.0	30	0.249	0.115	13.8%	7.2%	0.00	0.00	0.00	0.000001	0.0000002
Average	13,569	37.2	99,929	273.8	95	0.846	0.308	26.4%	9.8%	0.11	0.03	0.14	0.000006	0.0000004

OP-10-23
cont.

Table 1: Results of Flash Test Data at random sample locations upstream of gauge tanks.

⁵ Actual oil throughput of the tank in bbl/yr
⁶ Calculated daily average oil throughput [Oil Throughput (bbl/yr) ÷ 365 (days/yr)]
⁷ Actual produced water throughput of the tank in bbl/yr
⁸ Calculated daily average produced water throughput [Water Throughput (bbl/yr) ÷ 365 (days/yr)]
⁹ Calculated days of operation per year [Hours of operation (hrs/yr) ÷ 24 (hrs/day)]
¹⁰ Measured Gas to Oil ratio
¹¹ Measured Gas to Water ratio
¹² Measured CH₄ concentration in flash gas, oil
¹³ Measured CH₄ concentration in flash gas, water
¹⁴ Calculated CH₄ emissions from flash gas, oil in MT CH₄
¹⁵ Calculated CH₄ emissions from flash gas, water in MT CH₄
¹⁶ Calculated CH₄ emissions from all flash gas, oil + water in MT CH₄
¹⁷ Calculated CH₄ emission factor MT CH₄ per bbl of oil [(Calculated CH₄ emissions from flash gas, oil in MT CH₄) ÷ (Actual oil throughput of the tank in bbl/yr)]
¹⁸ Calculated CH₄ emission factor MT CH₄ per bbl of water [(Calculated CH₄ emissions from flash gas, water in MT CH₄) ÷ (Actual produced water throughput of the tank in bbl/yr)]

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Based on the above emissions data, the average emissions are 0.14 MT CH₄ per gauge tank per year or 0.000006 MT CH₄ per year/bbl Oil and 0.000004 MT CH₄ per year/bbl Water.

The total emissions from all gauge tanks are expected to be approximately 28 MT CH₄ per year (200 x 0.14 MT CH₄ per gauge tank per year). Compared to ARB's total estimated emissions from uncontrolled tanks and separators (Economic analysis, Appendix D, Page B-26), our estimates show that emissions from gauge tanks represent **less than 0.36%** of the expected emissions reductions for the source category (28 MT CH₄ per year ÷ 7,865 MT CH₄ per year).

OP-10-23
cont.

7. Costs of Control:

a. *Economic Analysis:* ARB's Economic Analysis does not take into account the cost to control emissions from gauge tanks with the use of a vapor collection system, as required by section 95668(a)(6). The legal deficiencies of the Economic Analysis are discussed further in Issue 53 below.

b. *SRIA:* ARB's SRIA also does not consider the impacts of controlling emissions from gauge tanks in its analysis. In fact, the SRIA does not mention gauge tanks and does not consider potential emission reductions from adding vapor collection systems to such tanks or the potential cost of such controls. The legal deficiencies of the SRIA are discussed further in Issue 54 below.

OP-10-24

8. **Draft Environmental Assessment:** ARB's Environmental Assessment ("EA") for the proposed regulation does not take into account gauge tanks and the potential environmental impacts associated with the proposed regulation's requirement to control emissions from those tanks with vapor collections systems. The legal deficiencies of the EA are discussed in further detail in Issue 55 below.

OP-10-25

Recommendation 10: WSPA recommends that ARB remove gauge tanks from the proposed regulation. WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-26

Issue 11: Section 95668(a)(2)(A) of the proposed regulation states that the requirements are not applicable to separator and tank systems that receive less than 50 barrels of crude oil per day and that receive less than 200 barrels of produced water per day. There is no mention of condensate.

In addition, several operators may have large amounts of produced water compared to the amount of oil produced. In several fields, the ratio of oil to produced water can be 1-10% oil to 99-90% water. Furthermore, ARB has not considered low condensate throughputs for this exemption.

Recommendation 11: WSPA recommends that ARB recognize the average production ratios in California and make the following changes to Section 95668(a)(2)(A):

Separator and tank systems or any tanks that receive less than 100 ~~50~~ barrels of crude oil or condensate per day and-or that receive less than 1,000 ~~200~~ barrels of produced water per day.

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-27

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Issue 12: Section 95668(a)(2) does not recognize any exemptions for heavy oil fields where the amount of flash gas is expected to be insignificant. Our understanding is that ARB would like to not impose burdensome requirements on heavy oil fields where the amount of flash gas is expected to be very low.

Recommendation 12: In order to clarify the above understanding, WSPA recommends that ARB add the following to Section 95668(a)(2) –

~~(B)~~(C) Separator and tank systems or any tanks that receive production from wells that have an API gravity of 20 or lower.

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-28

Issue 13: Section 95668(a)(2) does not recognize any exemptions for small tanks. By design, smaller production wells are served by small tanks and the estimated emissions expected to be insignificant.

Recommendation 13: WSPA recommends that ARB add the following to Section 95668(a)(2) –

(E) Tanks with a capacity of 300 bbls or smaller.

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-29

Issue 14: Section 95668(a)(2) provides exemptions for separators or tanks that have not stored liquid for 30 days. WSPA believes that 30 days is a short duration. In several cases, a tank may be used to store liquids for only a few hours during a day.

Recommendation 14: WSPA recommends that ARB modify Section 95668(a)(2) as follows –

Separators, tanks, and sumps that have ~~not~~ contained crude oil, condensate, or produced water for ~~at least no more than a total of 45 30~~ calendar days or 1,080 hours during a calendar year.

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-30

Issue 15: Section 95668(a)(2) provides exemptions for separators or tanks that recover less than 10 gallons per day of any petroleum product. WSPA believes that 10 gallons is a very small volume.

Recommendation 15: WSPA recommends that ARB modify Section 95668(a)(2) as follows –

~~(F)~~(H) Tanks that recover less than 10 ~~gallons-barrels~~ per day of any petroleum product from equipment provided that the owner or operator maintains, and can make available at the request of the ARB Executive Officer, a record of the amount of liquid recovered.

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-31

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Issue 16: Sections 95668(a)(2)(D) & (E) outline exemptions for tanks holding or storing liquids from a well less than 90 days unless the liquid is from a well that underwent a well stimulation treatment. Our understanding is that ARB intends to not exempt “circulation tanks used in conjunction with the well stimulation treatments” with this exception. However, as currently written, the statements might be misunderstood to include any tank that receives liquids from any well that may have undergone well stimulation treatment in the past.

In addition, it is our understanding that the exemptions below include general facility maintenance, including spill response. When taking equipment out of service, portable tanks are used to temporarily replace the equipment or to store fluids transferred out of the equipment.

Recommendation 16: WSPA recommends that ARB revise the section to read:

~~(D)(F)~~ Tanks used for temporarily separating, storing, or holding liquids from any newly constructed well for up to 90 calendar days following initial production from that well. ~~provided that the tank is not used to circulate liquids from a well that has been subject to a well stimulation treatment. This does not include circulation tanks used in conjunction with well stimulation treatments.~~

~~(E)(G)~~ Tanks used for temporarily separating, storing, or holding liquids from wells undergoing rework, maintenance, or inspection for up to 90 calendar days. ~~provided they are not used to circulate liquids from a well that has been subject to a well stimulation treatment. This does not include circulation tanks used in conjunction with well stimulation treatments.~~

OP-10-32

Issue 17: WSPA’s previously submitted comments on May 22, 2015 address high costs associated with the installation of vapor collection systems. Based on 2013 GHG MRR data, a threshold of 10 MT CH₄/yr would result in a compliance cost of about \$200/MT CO₂e (GWP = 21 for CH₄) or \$58/MT CO₂e (GWP = 72 for CH₄).

ARB’s economic analysis uses very low and outdated 10-yr old costs (EPA 2006) of installing a vapor recovery system (Table B-7, ARB Economic Analysis). The costs today are at least 3-10 times the costs depending on the size of the operations. Furthermore, ARB does not provide the basis for savings that are estimated to be 2,637 MT CH₄ or \$ 498,259 per year or the cost-effectiveness of \$7.81 per MT CO₂e. In addition, all gas is assumed to be saleable pipeline quality (high BTU content) with a market value of \$3.44 per MSCF. However, most gas collected in vapor recovery systems has low BTU content, does not meet pipeline specifications, and cannot be sold. ARB’s cost-effectiveness analysis is inadequate with multiple assumptions.

WSPA’s cost effectiveness analysis (submitted March 4, 2016) shows that the threshold of applicability at 100 MT CH₄ will have a 20-yr cost-effectiveness of ~\$40/MT CO₂e (GWP = 21 for CH₄) or ~\$12/MT CO₂e (GWP = 72 for CH₄) controlled.

ARB has still not provided a unit-level or operator level cost-effectiveness analysis. WSPA re-asserts the importance of conducting unit-level cost effectiveness analysis for objective evaluation of economic impacts on operators.

OP-10-33

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Recommendation 17: WSPA requests that ARB revise the economic analysis with latest cost data and obtain realistic gas quality data to evaluate the market value to determine the actual savings. WSPA strongly urges that ARB review the data that has been already provided (March 4, 2016) and re-consider the threshold of applicability at 100 MT CH₄.

OP-10-33
cont.

Issue 18: Certain operators may be willing to voluntarily install vapor recovery systems on separator and tank systems regardless of the emissions by January 1, 2019. The current regulation does not allow a provision for such operators to forego the flash testing requirements.

Recommendation 18: WSPA requests that ARB allow the following provision to the Section 95668(a)(3)

—
(3) By January 1, 2018, owners or operators of existing separator and tank systems that are not controlled for emissions with the use of a vapor collection system shall conduct flash analysis testing of the crude oil, condensate, or produced water processed, stored, or held in the system.

OP-10-34

(A) An operator may forego the January 1, 2018 flash analysis testing requirement and instead elect to install vapor recovery system on a separator and tank system as specified in 95668(a)(6). In order to comply, the owner or operator must submit permit applications to the local Air District by January 1, 2018.

Issue 19: Section 95668(a)(5)&(6) of the proposed regulation require addition of a vapor collection system to an existing separator and tank system based on the result of a single annual flash analysis test. A single test result may indicate an annual emission rate very close to 10 metric tons per year of methane which would require an operator to make a large capital investment based on only one data point. Section 95668(a)(5)(F) allows the ARB Executive Officer to request additional testing at their discretion. The operator should be given a similar opportunity to be confident in the result of the testing.

Recommendation 19: WSPA recommends the addition of a Section 95668(a)(5)(G) to allow the operator of a separator and tank system to perform additional flash analysis testing in a year and use the average of the test results to determine the need for addition of a vapor collection system as specified in 95668(a)(6).

OP-10-35

(G) Operators of a separator and tank system may perform additional flash analysis testing in a year and use the average of the test results to determine the need for addition of a vapor collection system as specified in 95668(a)(6).

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

Issue 20: Section 95668(a)(7) of the proposed regulation states that new separator and tank systems have 180 days from initial flash testing to install vapor collection system. WSPA believes that this does not allow for sufficient time to receive lab analysis and results and for subsequent design, procurement and contracting the construction of the system. Additionally, for a project of this magnitude, budgets must

OP-10-36

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

be presented and approved for most stakeholders at least a year in advance. Furthermore, the permitting process may take longer than expected and dependent on Air District schedules.

Assuming an implementation date of early 2017, the proposed regulation currently allows for up to 2 years for vapor collection system installation on existing systems over the emissions control threshold.

Recommendation 20: WSPA recommends that ARB allow for 2 years from initial flash testing, for the installation of vapor collection system on a newly constructed separator and tank system.

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-36
cont.

Issue 21: The proposed regulation does not provide any clarity on requirements for existing systems that exceed the threshold after January 1, 2019.

Recommendation 21: WSPA recommends that ARB clarify requirements for existing systems that exceed the threshold after January 1, 2019 allowing for 2 years from the date of flash testing when the emissions threshold is exceeded to install a vapor collection system. WSPA recommends the following addition to the proposed requirements –

~~(7)~~(8) Beginning January 1, 2019, owners or operators of existing separator and tank systems that exceed the annual emission rate of 100 metric tons per year of methane shall control the emissions from the separator and tank system with the use of a vapor collection system as specified in section 95668(c) within 24 months of conducting flash analysis testing.

OP-10-37

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Circulation Tanks for Well Stimulation Treatments

Issue 22: WSPA resubmits our previous comment submitted on March 4, 2016 with regards to the definition of a circulation tank as seen below.

Section 95667(a)(6) defines circulation tanks as follows -

“Circulation tank” means a tank or portable tank used to circulate, store, or hold liquids or solids from a crude oil or natural gas well during or following a well stimulation treatment.

It is our understanding that ARB intends to control circulation tanks that are used in conjunction with the well stimulation events. The current definition includes the term “or following” that may be misinterpreted to include any tanks receiving fluids from a well that may have undergone well stimulation in the past.

Recommendation 22: WSPA recommends that ARB clarify the definition to accurately reflect ARB's intent -

*“Circulation tank” means a tank or portable tank used to circulate, store, or hold liquids or solids from a crude oil or natural gas well during or following a well stimulation treatment **but prior to the well being put on production.***

OP-10-38

Issue 23: Section 95668(b)(1) outlines the requirements of a best practices management plan (BPMP) required to be implemented when circulation tanks are used in conjunction with well stimulation treatments. WSPA understands operators can submit BPMP that are representative for similar groups of wells undergoing a similar process at a facility.

WSPA requests that ARB provide clarification regarding the submittal process for these plans.

Recommendation 23: WSPA recommends the following language to Section 95668(b)(1):

(1) ***Beginning** January 1, 2018, owners or operators of circulation tanks used in conjunction with well stimulation treatments at facilities listed in section 95666 shall implement a best practices management plan that is designed to limit methane emissions from circulation tanks, and shall **provide make that plan available to ARB upon request.** Each plan must contain a list of best practices, ~~identified on the basis of substantial evidence recorded in the plan,~~ to address the following issue areas:*

- (A) *Inspection practices to minimize emissions from circulation tanks.*
- (B) *Practices to reduce venting of emissions from circulation tanks.*
- (C) *Practices to minimize the duration of liquid circulation.*
- (D) *Alternative practices to control vented and fugitive emissions.*

OP-10-39

Issue 24: ARB's emissions estimates and costs associated with circulation tanks are outlined below –

OP-10-40

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Parameter	Statewide	Per Event ¹⁹
MT CO ₂ e (GWP = 72) ²⁰	4,900	8.36
MT CH ₄	68.1	0.12
ARB Proposed Costs	\$186,000	\$317.4
ARB Proposed Benefits	\$17,000	\$29.01
ARB Proposed Cost Effectiveness (\$/MT CO ₂ e)	\$34	\$34

OP-10-40
cont.

- Emissions from Circulation Tanks are Extremely Small**

Based on the emission estimates presented by ARB, the circulation tank source category represents **0.4%**²¹ of the total statewide emissions that ARB plans to control with the proposed regulation. As seen above, per ARB, this represents 0.12 MT or 264.5 lbs CH₄ per event. WSPA does not agree with these emissions estimates since the 2015 WSPA circulation tank test results demonstrate even fewer emissions

OP-10-41

¹⁹ Based on Kern County Environmental Impact Assessment Report, approximately 1,025 well stimulation events were conducted over a period of 21 months (1/1/2014 and 9/30/2015). Based on this data, we estimated approximately 586 well stimulation events are conducted annually within the state of California.

Table 25: Number of Well Stimulation Treatments by Stimulation Type and Oil Field

Oil Field	Acid Fracture	Acid Matrix	Hydraulic Fracture	Totals by Oil Field
Belridge, North			149	149
Belridge, South	1		704	705
Elk Hills		18	44	62
Kettleman Middle Dome		2		2
Lost Hills			88	88
North Coles Levee			2	2
Rose			12	12
Stockdale			1	1
Ventura			3	3
No Associated Field			1	1
Totals by Stimulation Type	1	20	1004	1025

Counties/Districts not listed did not contain occurrences of well stimulation treatment.
Source: Interim Well Stimulation Database, WST Disclosures Index, operator disclosures

²⁰ ARB Presentation February 4, 2016

²¹ Per ARB's estimates presented on [February 4, 2016](#), emissions from Circulation tanks are 4,900 MT CO₂e out of a total proposed control of 1.2 million MT CO₂e

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

with an average of approximately 0.012 or 26 lbs CH₄²² per event (ten times smaller emissions). This data shows that circulation tanks are an insignificant source of emissions in California, and ARB has not provided the technical basis for proposing a regulation to control emissions from such a small source category.

OP-10-41
cont.

- **Zero Benefit/Market-Value of Gas**

WSPA disagrees with ARB's valuation (\$17,000) of the gas captured from circulation tanks. These vapors contain very few hydrocarbons. The WSPA testing showed an average higher heating value (HHV) of 7 Btu/scf²³. The estimated average heat content is 1.6 MMBTU for an entire event. There is no market-value for this gas as it does not meet pipeline specifications and cannot be sold.

OP-10-42

When compared to pipeline quality gas (900 – 1,150 Btu/scf) or field/waste gas (200 – 900 Btu/scf), the vapors (7 Btu/scf) are extremely low quality and non-combustible without the addition of supplemental higher heating value fuel. There is zero financial benefit in capturing this gas. ARB's proposed benefits of \$17,000 are completely baseless.

WSPA is concerned that a significant amount of effort will be required by ARB and Air Districts to implement and manage the program for minute methane emissions reductions (easily outweighed by emissions from additional criteria pollutants) and virtually no associated benefit. Additionally, operators would have to comply with the proposed unsafe and exceedingly burdensome requirements outlined below -

OP-10-43

²² Per 2015 WSPA Circulation Tank Test Results, the methane emissions ranged from 0.24 lb CH₄ to 132 lb CH₄ with an average of 26 lb CH₄.

²³ Per 2015 WSPA Circulation Tank Test Results, the calculated HHV ranged from 0.003 Btu/scf to 57 Btu/scf with an average of 7 Btu/scf.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

	Needed Equipment/ Infrastructure	Concerns
1. REQUIRED CAPTURE		
Installation of Vapor Collection System	~125 kW Diesel powered generator for the vapor recovery compressor at a temporary location	GHG and criteria emissions from diesel combustion
2. REQUIRED CONTROL		
Option 1: Direct vapors to existing sales gas system/existing fuel system/underground injection well	Existing sales gas system/existing fuel system/underground injection well	Safety and explosion risk (introduction of air/oxygen into existing systems)
Option 2: Direct vapors to a Vapor Control Device	Installation of Flare (15 ppmv NOx @3% O ₂)	Increased GHG and criteria pollutant emissions from supplemental fuel for flaring

OP-10-43
cont.

The above requirements are being proposed for a source with extremely small emissions and used for very limited periods of time leading to capture of emissions less than the 1 MT CH₄ (2015 WSPA Recirculation Tank Testing).

Recommendation 24: WSPA does not believe that there is a justifiable reason for ARB to propose control requirements for this source category as no benefit can be gained from the potential capture of an insignificant amount of low quality vapors from circulation tanks. Additionally, WSPA believes that the control of this source category cannot be achieved safely or without additional criteria pollutants. WSPA is recommending that ARB allow the continued use of best management practices to achieve emissions reductions beyond 2020.

OP-10-44

WSPA's recommendation for regulatory language is included in Attachment A.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Issue 25: ARB has proposed unsafe mandatory control measures that require operators to install a vapor collection system (Section 95668(b)) on circulation tanks and connect the system to either an existing sales line, existing fuel line or inject the vapors underground. Vapors collected from the circulation tanks contain insignificant and varying concentrations of hydrocarbons (C1 – C6+) ranging from 0 to 5%²⁴ with high amounts of introduced air from the circulation process (95-100%). Connecting oxygen-rich vapors to an existing sales or fuel line containing hydrocarbons will create an explosive environment.

WSPA has been re-iterating this concern to ARB (WSPA letters dated March 4, 2016) without response. ARB has not included any safety provisions in the regulation. While it appears that ARB is proposing several options, the fact is that the safety concerns eliminate almost all options leaving flaring as the only method of control for this source category, if allowed by Air Districts. In the absence of Air District approval, operators would have to shut down operations (§95668(c)(5)).

Recommendation 25: WSPA recommends that ARB remove unsafe mandatory control measures from the proposed regulation. At a minimum, WSPA urges ARB to incorporate alternative control methods that maintain safe practices.

WSPA's recommendation for regulatory language is included in Attachment A.

OP-10-45

Issue 26: As discussed above, flaring is the only option available for an operator in the absence of safe alternatives for emissions control from circulation tanks. There are significant issues with the flaring option as discussed below:

Restrictions on Flare Use

- **Permitting:** ARB is assuming that Operators will be allowed to install new flares or use existing flares. However, it is extremely difficult, if not impossible, to obtain permits from local Air Districts for new or increased flaring, especially in regions classified as non-attainment, such as within the San Joaquin Valley Air Pollution Control District.
- **Flare use (Emergency only):** Operators may have existing stationary emergency flares on site. However, these flares can only be used in emergency or upset conditions. Emergency flares are not allowed to be used for flaring of vapors during normal operation of circulation tanks. Further, these flares cannot accommodate the low volume and low BTU content emissions from recirculation events without makeup fuel.
- **Location of Existing Process Flares:** There are few stationary process flares currently permitted in the state for oil and gas operations and most are not located within the vicinity of field operations where well stimulation occurs. If any are located near the fields, the flares are larger and sized for field gas streams with higher flow rates and heat content. These larger flares are

OP-10-46

²⁴ Per 2015 WSPA Circulation Tank Test Results, total hydrocarbons (C1 to C6+) ranged from 0 to 5% by volume.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

not able to adequately combust the extremely low heating value and low volume vapors from circulation tanks unless supplemental fuel is also combusted to meet all regulatory and stoichiometric requirements.

- **Portable Flares:** Small portable flares (usually rented or leased), as described above, are the only option for operators but can only be used at accessible, remote locations where safety and risk are not an overriding issue. In most cases where well stimulation events occur in California (e.g. - Belridge Field), oil fields are congested and portable flares can pose safety issues due to fire risk.

OP-10-46
cont.

Control Measures Will Result in Higher Emissions

Proposed Control measures will result in additional GHG and criteria pollutant emissions from both capture and control of vapors from circulation tanks. WSPA has quantified the additional emissions below

- **Emissions from Capture of Vapors from Circulation Tanks:** Operators are required to capture vapors from circulation tanks by using a portable vapor recovery compressor. Compressors in this service are typically powered by a portable diesel generator. Additional criteria pollutant emissions are expected from the diesel generators and the estimates are provided in the table below.

OP-10-47

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Pollutant	Additional Emissions from 125 kW Diesel Generator ²⁵ (per event)	Additional Emissions from 125 kW Diesel Generator (annual statewide ²⁶)
CH ₄ (lbs)	0.06	33
N ₂ O (lbs)	0.01	7
CO ₂ (lbs)	1,399	819,986
NO _x (lbs)	38	22,298
SO _x (lbs)	2.5	1,475
VOC (lbs)	3.1	1,808
CO (lbs)	8.2	4,805
PM ₁₀ (lbs)	2.7	1,582

OP-10-47
cont.

As seen above, capture of vapors from circulation tanks using a vapor recovery system alone produces approximately 38 lbs of additional NO_x per event mostly within the jurisdiction of SJVAPCD²⁷.

- **Emissions from Flaring of Vapors from Circulation Tanks:** As stated above, the vapors from circulation tanks contain very few hydrocarbons making combustion of the vapors inefficient (i.e. inconsistent burning, low destruction efficiency, and the potential for smoke) or impossible without the addition of supplemental fuel. The average higher heating value (HHV) of the vent gas from circulation tanks is expected to be approximately 7 Btu/scf²⁸ at an average flow rate of 527 scfm with inconsistent and varying concentrations of methane during the circulation process.

OP-10-48

Per 40 CFR 60.18, flares²⁹ are required to maintain an HHV of at least 300 Btu/scf. In order to combust vapors from circulation tanks and meet the requirements of 40 CFR 60.18, operators would be required to add supplemental fuel. The amount of supplemental fuel required would depend on the quality of the vapors collected from circulation tanks and the size of the flare (minimum flow for the available flare).

The following table shows methane emissions from control of vapors from circulation tanks with natural gas (HHV = 1,020 Btu/scf³⁰) as supplemental fuel using a low NO_x flare as specified in Section 95668(c)(4)(B)(2) –

²⁵ Emission Factors from AP-42 Section 3.3-1 (<https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s03.pdf>)

²⁶ Based on Kern County Environmental Impact Assessment Report, approximately 1,025 well stimulation events were conducted over a period of 21 months (1/1/2014 and 9/30/2015). Based on this history, additional emissions were based on an estimated rate of 586 well stimulation events per year.

²⁷ Based on Kern County Environmental Impact Assessment Report, 99.7% percent of well stimulation events occur in Kern and Kings Counties, which are under the jurisdiction of San Joaquin Valley Air Pollution Control District.

²⁸ Per 2015 WSPA Circulation Tank Test Report, the calculated HHV ranged from 0.003 Btu/scf to 57 Btu/scf with an average of 7 Btu/scf.

²⁹ For steam-assisted or air-assisted flares required to meet Best Available Control Technology (BACT).

³⁰ PUC natural gas heating value

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Pollutant	Additional Emissions from Flaring of Vapors from Circulation Tanks ³¹ (per event)	Additional Emissions from Flaring of Vapors from Circulation Tanks (annual statewide ³²)
CH ₄ (lbs)	180.40	105,716
N ₂ O (lbs)	0.02	12
CO ₂ (lbs)	11,754.34	6,888,044
NO _x (lbs)	1.79	1,047
SO _x (lbs)	0.06	35
VOC (lbs)	13.74	8,053
CO (lbs)	36.33	21,288
PM ₁₀ (lbs)	0.75	437

OP-10-48
cont.

As seen above, flaring of vapors from circulation tanks produces approximately 1.8 lbs of additional NO_x per event.

• **Total Emissions from Capture and Control of Vapors from Circulation Tanks:**

The following table shows methane emissions from circulation tank vapors (Emissions with No Control) and emissions from capture (diesel generator) and control (Low NO_x flare) of vapors from circulation tanks as specified in Section 95668(c)(4)(B)(2) –

OP-10-49

³¹ <https://www3.epa.gov/ttnchie1/ap42/>

Emission Factors:			
NO _x :	0.0182	lb/MMBtu	(Proposed regulation limit of 15 ppmv @ 3% O ₂ converted to lb/MMBtu based on natural gas)
CO:	0.37	lb/MMBtu	(AP-42, "Industrial Flares", Table 13.5-1)
PM ₁₀ :	7.6	lb/MMscf	(AP-42, "Natural Gas Combustion", Table 1.4-2)
SO _x (as SO ₂):	0.0006	lb/MMBtu	(AP-42, "Natural Gas Combustion", Table 1.4-2)
VOC:	0.1372	lb/MMBtu	Section 13.5 of AP-42, Table 13.5-1 lists a THC emission factor of 0.14 lbs/MMBtu. The flare VOC emission factor for non-methane, non-ethane hydrocarbons is determined using an average of 2% Methane and 0% Ethane estimated from vent samples.

³² Based on Kern County Environmental Impact Assessment Report, approximately 1,025 well stimulation events were conducted over a period of 21 months (1/1/2014 and 9/30/2015). Based on this history, additional emissions were based on an estimated rate of 586 well stimulation events per year.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Pollutant	AVERAGE PER EVENT		AVERAGE ANNUAL STATEWIDE	
	Vapor Emissions from Circulation Tanks with No Control	Additional Emissions from 125 kW Diesel Generator + 95% Control with Flare	Vapor Emissions from Circulation Tanks with No Control	Additional Emissions from 125 kW Diesel Generator + 95% Control with Flare
CH ₄ (lbs)	26	180	15,053	105,749
N ₂ O (lbs)	-	0	-	19
CO ₂ (lbs)	-	13,154	-	7,708,030
NO _x (lbs)	-	40	-	23,345
SO _x (lbs)	-	3	-	1,509
VOC (lbs)	-	17	-	9,861
CO (lbs)	-	45	-	26,093
PM ₁₀ (lbs)	-	3	-	2,020

OP-10-49
cont.

As seen above, flaring of vapors from circulation tanks produces approximately 40 lbs of additional NO_x per event.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

The increase in SJVAPCD-wide criteria pollutant emissions inventory due to additional flaring is shown below –

Pollutant	Existing SJVAPCD Flare Emissions Inventory³³	% Increase with 95% Control of Circulation Tank Vapors with Flare
NOx (lbs)	205,780	11%
SOx (lbs)	116,920	1%
VOC (lbs)	120,120	8%
CO (lbs)	120,120	22%
PM₁₀ (lbs)	49,800	4%

OP-10-50

The additional and significant amounts of criteria pollutant emissions *significantly* outweigh the effectiveness of proposed reductions on extremely small amounts of methane emissions (0.4% of the state-wide methane emissions) from circulation tanks. Based on the information provided above, WSPA does not believe the proposed controls are justified.

High Costs of Vapor Control Device

- The costs provided by ARB significantly underestimate the costs of control (\$317 per event or \$186,000 statewide). Although none of the technologies currently available have demonstrated safe and efficient controls, the estimates for renting potential control equipment are significantly higher than what ARB is assuming. Based on our conversations with equipment suppliers, the equipment to separate gas from a circulation tank (not including piping) rental alone would cost an operator between \$3,600 and \$7,700 per event or \$2.1M and \$4.5M statewide for the assumed 586 well stimulation events per year, if operators are allowed to use a temporary flare.
- It is clear that ARB's cost analysis has not included costs of permitting, engineering and safety analysis, auxiliary equipment rental (such as compressor, flare, piping, and other necessary instrumentation such as meters), costs associated with labor to configure and dismantle the control equipment, training, and other costs.

OP-10-51

Proposal is Not Cost-Effective

- WSPA believes that the proposed cost-effectiveness does not represent the true cost of this control measure.

OP-10-52

³³ Based on 2014 emissions inventory data from existing permitted flares in San Joaquin Air Pollution Control District.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

ARB has not addressed any of these issues. As discussed above, WSPA is concerned that ARB is proposing a significant amount of effort (and costs) to control a very small amount of emissions. WSPA believes that the requirements are ineffective in terms of controlling emissions and not at all cost-effective.

OP-10-52
cont.

Recommendation 26: For reasons described above, WSPA recommends that ARB consider changes proposed in Section 95668(b) suggested in Attachment A.

OP-10-53

Issue 27: Section 95668(b)(2) states that by January 1, 2019, operators must submit an emissions testing report detailing the results of testing emissions control measures on recirculation tanks. There are several issues with this requirement –

OP-10-54

- **Lack of Clarity in Testing Requirements:** It is unclear who must conduct the test, how many tests must be conducted, and what is considered an appropriate test.
- **Engineering and Safety Evaluations are Needed prior to Testing:** So far, ARB has only discussed few ideas with equipment/engineering vendors and then shared with WSPA as probable solutions. ARB has yet to actually identify or propose a viable control technology that would achieve the proposed requirements. Engineering and safety evaluations are needed to determine which technologies need to be considered, if any technologies have the potential beyond just preliminary concepts, and if any technologies have the potential to be safely implemented and achieve the desired results. Without this evaluation, ARB is requiring operators to conduct testing and implement controls. WSPA believes that this is a critical gap in the proposed regulation.
- **Concerns about Economic Impacts of Testing:** WSPA is also concerned that the economic impact of this testing has not been taken into account in ARB's economic analysis. Notwithstanding our concerns expressed above regarding safety and potential increase of additional criteria and methane emissions, ARB's desire to see new technologies developed for circulation tanks should be researched and funded by ARB and the burden should not be placed on operators. WSPA members understand that WSTs are conducted by operators; and are willing to work with ARB; subject to safety and HES concerns and well stimulation permit approval. ARB should provide the resources for this research activity. WSPA estimates that the cost of this testing and reporting could range from \$25,000 to \$100,000 per event, dependent on the type of technology that is being tested. Currently, no technology is available in the market that can safely and effectively capture and control emissions from this system.
- **Lack of Results Assessment Step Prior to Control Requirements:** There is an underlying conclusion in the proposed regulation that a 95% control can be achieved for the circulation tanks in a rather short timeline and within the cost estimates assumed by ARB within the economic analysis. However, if such safe, cost-effective technology does not emerge from the testing, operators would have to shut down the WST operations. ARB needs to recognize that this scenario may occur and must prepare to conduct additional economic analysis and environmental assessment using the test results. ARB should also include alternate technically feasible means to comply in such cases. Therefore, in the event no safe and cost-effective control technologies

OP-10-55

OP-10-56

OP-10-57

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

emerge from the testing, the operator should be able to continue to implement the BPMPs beyond January 1, 2020.

OP-10-57
cont.

- **Lack of Clarity in Requirements Beyond 2020:** It is WSPA's current understanding, from conversations with ARB staff, that it is the intention of the regulation to allow for continued use of BPMPs beyond 2020 if appropriate, safe, and compliant control technology cannot be developed even after best efforts have been made to do so. WSPA is concerned that the current proposed regulation does not reflect this intent.

OP-10-58

Recommendation 27: WSPA recommends that ARB remove Sections 95668(b)(2)&(3) from the proposed regulation.

If ARB continues to require operators to evaluate technologies proposed to ARB by various vendors, ARB must clarify the requirements of 95668(b). WSPA suggests the following:

(2) ~~By January 1, 2019, An owners or operators of circulation tanks used in conjunction with well stimulation treatments beginning January 1, 2018 at the owner or operator's wells, shall conduct testing of control technologies that are available as of January 1, 2017 and determined by the operator to meet the operator's environmental and safety standards.~~

~~(2)(3) A written report including the detailed results of each test or a group of tests must be provided to the ARB Executive Officer by January 1, 2019. with a written report that details the results of equipment used to control emissions from circulation tanks with at least 95% vapor collection and control efficiency.~~

OP-10-59

(A) ~~The report shall include the results of testing conducted by the owner or operator or equipment manufacturers that demonstrate describe the measured vapor collection and control efficiency of the equipment including the disposition of collected vapors.~~

~~(A)(B) The ARB Executive Officer will evaluate the results of testing to determine control requirements on circulation tanks and will re-evaluate this section beyond 2020.~~

~~(4) By January 1, 2020, owners or operators of circulation tanks used in conjunction with well stimulation treatments shall control emissions from the tanks with at least 95% vapor collection and control efficiency.~~

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Vapor Collection Systems and Vapor Control Devices

Issue 28: Section 95668(c) divides separator and tank systems into two “buckets”: 1) a facility with an existing sales gas system, fuel gas system or gas disposal well(s); or 2) a facility currently without one or more of those three options. For facilities in the first bucket, there is no recourse should the existing gas handling option reach capacity or experience a catastrophic failure. For example, what options will be available for a facility that wants to expand and has an existing gas disposal well already operating near its capacity as established by the DOGGR? The facility cannot install a vapor control device as it is not allowed under 95668 (c)(2). If that gas disposal well undergoes a catastrophic failure and the facility cannot obtain a new disposal well permit from the DOGGR, what options are available?

OP-10-60

This section is entirely too prescriptive to be adapted across the entire suite of production operations in such a large and diverse state. An operator should be able to implement BACT and install the equipment.

Recommendation 28: WSPA recommends the following language:

(2) *Unless section 95668(c)(3) applies, the vapor collection system shall **safely** direct the collected vapors to one of the following **until system capacity is reached**:*

(A) *Existing sales gas system; or,*

(B) *Existing fuel gas system; or,*

(C) *Existing gas disposal well not currently under review by the Division of Oil and Gas and Geothermal Resources.*

(3) *If no **safe** existing sales gas system, fuel gas system, or gas disposal well specified in section 95668(c)(2) is available at the facility **or the existing system reaches capacity**, the owner or operator must control the collected vapors as follows:*

(A) *For facilities without an existing vapor control device installed at the facility:*

1. *~~–~~The owner or operator must install a new vapor control device that achieves at least 95% vapor control efficiency and incorporates Best Available Control Technology as defined and determined by the local air district for NO_x; or*

~~(A)2.~~ *~~The~~ owner or operator must install a new vapor control device as specified in section 95668(c)(4).~~–or,~~*

(B) *For facilities currently operating a vapor control device and which are required to control additional vapors as a result of this subarticle:*

1. *~~–~~The owner or operator must demonstrate to the local air district that an existing vapor control device achieves at least 95% vapor control efficiency and incorporates best available control technology as defined and determined by the local air district for NO_x; or*

OP-10-61

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

~~(B)2.~~ *The owner or operator must replace the existing vapor control device with a new vapor control device as specified in section 95668(c)(4) to control all of the collected vapors, if the device does not already meet the requirements specified in section 95668(c)(4).*

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-61
cont.

Issue 29: Section 95668(c)(4)(B)(2) does not allow use of supplemental fuel gas. As stated numerous times in the Staff Report (for example on page ES-1 and page 1) the goal of the proposed regulation is to obtain the maximum GHG emission reductions from the sector in a technically feasible and cost-effective manner. It is not technically feasible to combust collected vapors that have a heating value below the combustible range without the introduction of supplemental fuel gas. The equipment/engineering vendors WSPA member companies have consulted agree that supplemental fuel will be required for these gases.

As stated above, WSPA understands that the use of supplemental fuel will result in additional criteria pollutant emissions in order to dispose of collected vapors from circulation tanks. However, with no supplemental fuel, ARB's requirements put operators in a catch-22 situation – operators have to install vapor control devices that achieve 95% control while the only potential control technology will require a flare/incinerator that will need supplemental fuel for safe and complete combustion but will also add criteria pollutant emissions. To comply in this situation, the operators will have no other choice but to shut-down operations.

Recommendation 29: WSPA recommends that ARB allow operators to use supplemental fuel where the heating value below the combustible range. WSPA recommends the following change to Section 95668(c)(4)(B)(2) –

2. *A vapor control device that achieves at least 95% vapor control efficiency of total emissions and does not generate more than 15 parts per million volume (ppmv) NOx when measured at 3% oxygen. ~~and does not require the use of supplemental fuel gas, other than gas required for a pilot burner, to operate.~~*

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

OP-10-62

Issue 30: Section 95668(c)(5) of the proposed regulation states:

If the collected vapors cannot be controlled as specified in section 95668(c)(2) through (4), the equipment subject to the vapor collection and control requirements specified in this subarticle may not be used or installed and must be removed from service by January 1, 2018.

WSPA believes that the January 1, 2018 implementation date of this requirement should be January 1, 2019 to align with current proposed requirements of vapor collection system installation and as written is a carryover from a previous draft of the regulatory language.

Additionally, WSPA believes that in some areas of the State (95668(c)(4)(B)), if the existing system is permitted and offset within the applicable Air District and is operating in compliance with the stated parameters contained in the permit, no further action should be required. Only when the permitted throughput is exceeded should any action be initiated by the operator. Furthermore, if the equipment is

OP-10-63

OP-10-64

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

permitted with the APCD, an updated permitting document would be required to address emissions resulting from the increased throughput. It is unreasonable for CARB to assume that because an additional well is brought online that the existing system (permitted, offset and properly designed) would require replacement.

OP-10-64
cont.

Recommendation 30: WSPA recommends that ARB correct the implementation date of Section 95668(c)(5) as follows –

(5) If the collected vapors cannot be controlled as specified in section 95668(c)(2) through (4), the equipment subject to the vapor collection and control requirements specified in this subarticle may not be used or installed and must be removed from service by ~~January 1, 2018~~ the date the vapor collection system is required.

OP-10-65

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

Issue 31: Section 95668(c)(6) of the proposed regulation allows 30 days for vapor recovery downtime for maintenance. In several cases, 30 days may not be enough especially if vendor delays occur.

Recommendation 31: WSPA recommends that ARB allow 60 days for vapor recovery downtime for maintenance.

OP-10-66

WSPA's recommended changes to the proposed requirements are detailed in Attachment A.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Reciprocating and Centrifugal Natural Gas Compressors

Issue 32: Sections 95668(d)(4) and (e)(4) require annual testing of rod packing vents from reciprocating natural gas compressors and wet seal vents from centrifugal compressors. ARB's GHG MRR already requires annual testing and measurement of rod packing vents and wet seal vents. This requirement has been in place since 2012. Operators subject to requirements of both regulations have to conduct duplicate tests to comply with both Section 95668(d)(2) and (e)(5) of the proposed regulation and GHG MRR leading to doubling of costs with no added emissions benefit./

Recommendation 32: WSPA recommends that ARB allow operators to use results from the annual testing conducted per the requirements of MRR. WSPA recommends the changes to Section 95668(d)(4) and (e)(4) as follows –

(B)The compressor rod packing or seal emission flow rate through the rod packing or seal vent stack shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature using one of the following methods:

1.Flow rates measured annually as per the methods described in Greenhouse Gas Mandatory Reporting Regulation Section 95153(n); or,

~~4.2.~~ Vent stacks shall be equipped with a meter or instrumentation to measure the rod packing or seal emissions flow rate; or,

~~2.3.~~ Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six (6) feet above ground level or a permanent support surface for making individual or combined rod packing or seal emission flow rate measurements.

.....

(4)Centrifugal compressor wet seals shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature in order to determine the wet seal emission flow rate using one of the following methods:

(A)Flow rates measured annually as per the methods described in Greenhouse Gas Mandatory Reporting Regulation Section 95153(m); or,

~~(A)(B)~~ Vent stacks shall be equipped with a meter or instrumentation to measure the wet seal emissions flow rate; or,

~~(B)(C)~~ Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six (6) feet above ground level or a permanent support surface for making wet seal emission flow rate measurements.

OP-10-67

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Well Casing Vents

Issue 33: The proposed regulation includes a new source category for well casing vents. This source category was not included in any of the emissions estimates, or pre-draft regulation, or in the cost estimates provided by ARB. The staff report indicates that ARB would like to collect data through this requirement to estimate emissions from this source and potential future control requirements. The current economic analysis does not incorporate costs measuring flow rates. This category appears to include well vents that are normally open to the atmosphere.

WSPA would like to note that the Greenhouse Gas (GHG) Mandatory Reporting Regulation (MRR) requires operators to report GHG emissions from open well casing vents under the source category Associated Gas Venting and Flaring. All operators subject to MRR reporting and operating open well casing vents estimate the emissions data according to the procedure described in GHG MRR. The emissions are reported annually.

WSPA believes that new redundant data collection is unnecessary to estimate emissions from open well casing vents. In addition, WSPA is concerned that ARB has not included an economic analysis associated with measuring well casings.

Recommendation 33: WSPA recommends that ARB should utilize the existing and already available GHG MRR data to quantify emissions from well casing vents instead of creating an unnecessary and redundant dataset through burdensome measurement and reporting requirements. WSPA recommends that ARB remove requirements for this source category from the proposed regulation. If ARB does not remove the source category, WSPA recommends the following changes:

(1) *Beginning January 1, 2018, owners or operators of wells located at facilities listed in section 95666 with a well casing vent that is open to the atmosphere shall **comply with one of the following requirements** –*

*(A) ~~measure~~ Measure the natural gas flow rate from the well casing vent annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument); ~~and~~, **or***

(1) ~~—~~ (B) Calculate the volume of natural gas vented according to the Air Resources Board Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Title 17, Division 3, Chapter 1, Subchapter 10, Article 2, Section 95153(k) (February, 2015).

OP-10-68

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Leak Detection and Repair

Issue 34: ARB has stated that the number of components expected to be tested under LDAR are 1,339,185 and the uncontrolled emissions are estimated to be 13,650 MT CH₄ per year using the CAPCOA guidelines (Appendix D Economic Analysis, Pages B35-38). No further detail has been provided.

Most operators have existing and mature leak detection and repair programs under local air district rules. Operators have already shared this data on leakage rates within the existing LDAR programs with ARB very early in the rule-development process (2013 MRR data were provided previously in WSPA's comment letter dated 5/22/15). Based on this information on, the estimates in the initial Standardized Regulatory Impact Assessment (SRIA) correctly represented the state-wide emissions inventory.

However, for the latest emissions estimates, ARB has used significantly higher emission factors and leak rates than found in California's existing LDAR programs to estimate the emissions. Considering the actual data previously provided to ARB, the most recent LDAR emissions estimates and cost-effectiveness analysis are significantly skewed and clearly do not represent the actual emissions estimates.

Recommendation 34: WSPA recommends that ARB revise the emissions estimates and cost effectiveness of the LDAR requirements using demonstrated leak rates and emission factors that have been already provided to ARB.

OP-10-69

Issue 35: As explained in our previous comment letters, operators can have streams with very low concentrations of methane (e.g. some produced water streams). Conducting leak detection on these streams will never lead to identification of any leaks above the leak thresholds proposed in the regulation. The costs associated with implementing an LDAR program for such low-methane components would be onerous for operators with no associated emissions benefit.

Recommendation 35: WSPA recommends that ARB exempt components that are not expected to exceed the proposed leak thresholds due to very low methane concentrations handled by those components. WSPA recommends that ARB add the following exemption to Section 95669(e) –

Components exclusively handling streams which have methane concentration less than 10 percent by weight (<10 wt%).

OP-10-70

Issue 36: Section 95669(b)(5) states that "Components that are buried below ground" are exempt from the LDAR requirements of this regulation. This exemption goes on to state that "[t]he portion of well casing that is visible above ground is not considered a buried component". Repair of leaks associated with a well casing, buried or exposed at the surface could require obtaining and scheduling the services of a workover rig, disconnecting and killing the well, pulling the well, determining the cause, fixing the cause, then putting it all back together and releasing the rig.

In many cases it is not possible for operators to procure that type of equipment in the timeframes listed in the proposed regulation. Shutting in a well for repair requires specialized equipment, skilled labor, and

OP-10-71

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

financial resources to render the necessary repairs. A well shut-in project requires extensive planning to execute. The impromptu shut-in of an operating well subjects the well to potential damage ultimately causing damage to the formation in the general area of the well. Each well shut-in is a planned event, coordinated through both Production and Reservoir engineering to properly identify potential problems associated with the suspension of operation and to identify and execute mitigating actions for limiting potential damage to the well.

OP-10-71
cont.

Any repair to a leak located at a well casing may also require a blowdown. In most cases, as recognized in EPA's New Source Performance Standard OOOOa, the blowdown would result in greater emissions than would be reduced by repairing the leak. As such, well casing leaks should be allowed more reasonable and realistic repair times, at least 120 days unless the repairs can be completed during the next scheduled workover or well depressurizing event.

Recommendation 36: WSPA recommends that leaks associated with well casings be afforded a more realistic repair time of 120 days or by the next scheduled workover or rig servicing activity.

OP-10-72

Issue 37: Section 95669(b)(6) states that "[o]ne-half inch and smaller stainless steel tube fittings used to supply compressed air to equipment or instrumentation" are exempt from the LDAR inspection requirements of this rule. All components associated with air would not be associated with any emissions. WSPA is concerned that no exemptions have been proposed for components that are handling exclusively non-hydrocarbon streams such as compressed air, potable water, or clean produced water. The inspection of non-hydrocarbon service components would be a very costly burden for all stakeholders resulting in zero emissions benefit.

OP-10-73

Recommendation 37: WSPA recommends that ARB exempt all components that exclusively handle non-hydrocarbon streams. WSPA recommends that ARB add the following exemption to Section 95669(b) –

Components exclusively handling non-hydrocarbon streams.

Issue 38: The proposed regulation has different inspection frequency requirements for manned and unmanned facilities. However, no definition of the terms "manned facility" and "unmanned facility" have been provided. This can cause confusion and inconsistent understanding of requirements among operators. WSPA requests that ARB add definitions for the terms "manned facility" and "unmanned facility."

Recommendation 38: WSPA recommends that ARB add the following definitions from SJVUAPCD Rule 4409 (3.41)

OP-10-74

Unmanned Facility: a facility which has no permanent-sited operators. Permanent-sited operators means personnel responsible for the operation of the equipment subject to this rule are in attendance at the facility 24 hours per day.

Manned Facility: a facility that does not meet the definition of an unmanned facility.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Issue 39: Section 95669(e) refers to a number of component types. As currently written, this section is confusing regarding the need to inspect components that are not in operation. Additionally, different requirements for manned and unmanned facilities will lead to confusion on boundaries and frequency requirements especially in large fields.

Recommendation 39: WSPA recommends the following changes to Section 95669(e) –

(e) *Except for inaccessible or unsafe to monitor components, Owners or operators shall audio-visually inspect (by hearing and by sight) all operating hatches, pressure-relief valves, well casings, stuffing boxes, and operating pump seals for leaks or indications of leaks at least once every 24 hours for facilities that are visited daily, or at least once per calendar week for unmanned facilities; and,*

- (1) *Owners or operators shall audio-visually inspect all pipes for leaks or indications of leaks at least once every 12 months. Inspections performed pursuant to DOGGR requirements satisfy this requirement.*

OP-10-75

Issue 40: As ARB noted several times before and explained repeatedly in WSPA's previous Comment Letters, the majority of facilities are already in a mature LDAR program run by a local air district. With several years of data, these facilities show very low leak rates. Minimal additional methane reduction will be gained by starting with quarterly inspections for operators already in LDAR programs, while costs will quadruple. Beginning with quarterly inspections to demonstrate lower leak rates is extremely onerous without benefit. Operators who can demonstrate a leak rate below the proposed leak rates in the regulation within the first quarter of the first year of compliance or through using data from their existing program should be allowed to continue with annual inspections. This will also encourage operators to proactively comply with the leak detection requirements.

Recommendation 40: WSPA recommends that ARB allow operators to demonstrate lower leak rates than proposed in the regulation during the first quarter of the first year of compliance. Such operators should be allowed to continue with annual inspections unless the operator exceeds the thresholds in subsequent inspections at which time quarterly inspections would be required. WSPA recommends the following changes to the Section 95669(g) –

(g) *At least once each calendar quarter year, all components shall be tested for leaks of total hydrocarbons in units of parts per million volume (ppmv) calibrated as methane in accordance with EPA Reference Method 21 excluding the use of PID instruments.*

(1) *The annual inspection frequency will be increased to quarterly if the number of allowable leaks for each leak threshold category specified in Table 1 or 3 is exceeded during an inspection period.*

~~(1)~~(2) *The quarterly inspection frequency may be reduced to annually provided that the following conditions are met:*

(A) *All components have been measured for five (5) consecutive calendar quarters and the number of leaks has been determined to be below the number of allowable leaks for each leak threshold category specified in Table 1 or 3; and,*

OP-10-76

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

(B) *The change in inspection frequency is substantiated by documentation and approved by the ARB Executive Officer.*

(C) *The inspection frequency shall revert to quarterly at any time the number of allowable leaks specified in Table 1 or 3 is exceeded during any inspection period.*

OP-10-76
cont.

Issue 41: Section 95669(g)(3) states that “[a]ll inaccessible or unsafe to monitor components shall be inspected at least once annually using Method 21”. In many cases, these components have been determined to be unsafe to monitor due to the operation of associated equipment. WSPA believes that it is more appropriate, as required in SJVAPCD rule 4409, to require the monitoring of these components during the next regular process shutdown. The current annual timeline may require the shutdown of a process that would result in emissions greater than the emissions measured from the component.

OP-10-77

Recommendation 41: WSPA recommends that ARB edit the language of Section 95669(g)(3) as below:

(3) *All inaccessible or unsafe to monitor components shall be inspected during the next regular process shutdown ~~at least once annually~~ using Method 21.*

Issue 42: WSPA would like to re-iterate that Section 95669 Tables 1 & 3 allow very low leak rates including no leaks greater than or equal to 50,000 ppmv allowed after the first two years of the LDAR program. As written, just one leak of 50,000 ppmv or greater would require operators to conduct quarterly LDAR.

OP-10-78

From Table 5 of the draft Staff Report, the ARB estimates that there will be 393,000 MT CO₂e from LDAR programs after implementation of the regulations as proposed. ARB should provide the amount of leaks over 50,000 ppmv that contribute to this annual emissions estimate.

This is important as the ARB is proposing no leaks greater than 50,000 ppmv after 2020. Does the ARB's own analysis demonstrate that by implementing these regulations there will be no leaks greater than 50,000 ppmv?

Stating that there can be no leaks greater than 50,000 ppmv is unreasonable and not justified with current technology. WSPA strongly disagrees that an operator, who has an otherwise very effective LDAR program, should be penalized for one 50,000 ppmv leak. Statistically, it is difficult to have zero leaks that are 50,000 ppmv or greater and this requirement would lead to operators never being able to reduce the inspections to annual. A mature LDAR program will ultimately reduce such leaks. However, a field with 250,000 components will conduct 1,000,000 component inspections each year. The sheer number of components suggests that there is a statistically significant potential for leaks greater than 50,000 ppm. However, as the program matures, the potential for such leaks will decrease. Providing unrealistic regulatory mandates does nothing to drive the program especially when other aspects of the regulation address this issue.

OP-10-79

Recommendation 42: WSPA recommends that ARB allow reasonable leak rates for the LDAR program. WSPA recommends the following changes to Section 95669 Tables 1 and 3 –

OP-10-80

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Table 1 - Allowable Leaks Per Number of Components Inspected January 1, 2018 through December 31, 2019

<i>Leak Threshold</i>	<i>200 or Less Components</i>	<i>More than 200 Components</i>
<i>10,000-49,999 ppmv</i>	<i>5</i>	<i>2% of total inspected</i>
<i>50,000 ppmv or greater</i>	23	<i>1% of total inspected</i>

OP-10-80
cont.

Table 3 - Allowable Leaks Per Number of Components Inspected On or After January 1, 2020

<i>Leak Threshold</i>	<i>200 or Less Components</i>	<i>More than 200 Components</i>
<i>1,000-9,999 ppmv</i>	<i>5</i>	<i>2% of total inspected</i>
<i>10,000-49,999 ppmv</i>	23	<i>1% of total inspected</i>
<i>50,000 ppmv or greater</i>	02	<i>0.5% of total inspected</i>

WSPA also recommends that ARB delete 95669(o)(4). Detailed recommendations are included in Attachment A.

Issue 43: Section 95669(i) sets time periods for repairs after January 1, 2020. Heavy equipment or specialty equipment is needed to repair certain leaks. For example, a workover rig may need to be brought in to repair a leak from a component on a wellhead. It is not reasonable to expect that this equipment is ordered, transferred on-site, and fully operating within 2 calendar days or even 5 calendar days in all cases.

OP-10-81

Recommendation 43: WSPA recommends revising the proposed regulation to incorporate an extended repair period based on the number of components inspected. For example, a 15-day extension to the repair period can be implemented on 1% of the components inspected.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Critical Components

Issue 44: WSPA re-iterates and expand on a previous comment submitted on March 4, 2016 regarding the identification of critical components – both with regards to leak detection and repair as well as compressors. Section 95670(a) states that “By January 1, 2018 or within 180 days from installation, critical components used in conjunction with a critical process unit at facilities listed in section 95666 must be pre-approved by the ARB Executive Officer”.

OP-10-82

WSPA is concerned by this requirement of pre-approval of critical components. In the event that a component that is truly critical to a process is not identified in this administrative timeline, there must be allowances for the repair time of this component.

Additionally, WSPA is concerned that the current regulatory language puts ARB in the position of the decision-maker regarding which components are critical to process operations. WSPA believes that facility engineers and APCD inspectors are knowledgeable of the processes and should be deferred to in the decision of component criticality, especially in the face of safety concerns. If ARB would like additional validation of critical components, operators may obtain a professional engineer’s evaluation.

OP-10-83

Reporting of any leaks on critical components that are not repaired in the timeline allotted for leaks to non-critical components would provide ARB the oversight of repairs necessary to assure compliance with the rule without putting ARB in the position of determining which components are necessary for safe operations.

Recommendation 44: WSPA recommends that ARB allow knowledgeable operators or a professional engineer to identify and designate the critical components without needing approval from ARB. WSPA recommends that operators include in their annual report a list of any critical component not repaired in the timeline allotted for leaks to non-critical components in lieu of developing a pre-approved list of critical components.

OP-10-84

Issue 45: Section 95670(e) – Identifying critical components by tags will require a complete component inventory that will require continual updating. Facilities that already have a mature program to tag components do not tag every component. A tag is placed on a larger component and other nearby components are assigned to that tag. Therefore, tagging every component is not a common practice.

OP-10-85

Recommendation 45: WSPA recommends that ARB allow for a general description of the portion of the system that contains the critical components, which will be more helpful to the operators and the inspectors.

Issue 46: Throughout Section 95669 of the proposed regulatory text, ARB has updated the critical component repair time to one year. Table 2 and 4, however, contradictorily states a required repair time for critical components of 180 days. WSPA believes this to be an oversight and carry-over from the previous version of the proposed regulation.

OP-10-86

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Recommendation 46: WSPA recommends that ARB edit the value in Table 2 and 4 of Section 95669 to reflect the assumed intent of one year repair time for all critical components.

Table 2 - Repair Time Periods
January 1, 2018 through December 31, 2019

Leak Threshold	Repair Time Period
10,000-49,999 ppmv	14 calendar days
50,000 ppmv or greater	5 calendar days
Critical Components	Next shutdown or within 180 calendar days <u>12 months</u>

OP-10-87

Table 4 - Repair Time Periods
On or After January 1, 2020

Leak Threshold	Repair Time Period
1,000-9,999 ppmv	14 calendar days
10,000-49,999 ppmv	5 calendar days
50,000 ppmv or greater	2 calendar days
Critical Components	Next shutdown or within 180 calendar days <u>12 months</u>

Issue 47: Section 95669(m) requires open-ended lines and valves to be sealed. By not including a mitigation response, Section 95669(m) proposes to make any open-ended line or valve a violation of the Regulation. Open-ended lines and valves present an opportunity to leak similar to other components. Not all open-ended lines or valves are leaking; just like not all other components are leaking. However, in the proposed regulation, the ARB allows a repair time for a leak from other components, but no repair time is afforded to an open-ended line or valve that is not leaking. This is not equitable. A repair time for an open-ended line or valve should be developed just like for every other component. If the open-ended line or valve is leaking, then the more stringent leak repair times should be invoked. Also, the regulation should clearly state that process drains are not open-ended lines.

OP-10-88

Recommendation 47: WSPA recommends Section 95669(m) be revised to read:

(m) Open-ended lines and valves located at the end of lines shall be sealed with a blind flange, plug, cap or a second closed valve, at all times except during operations requiring liquid or gaseous process fluid flow through the open-ended line. Open-ended lines do not include process drains or vent stacks used to

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

vent natural gas from equipment and cannot be sealed for safety reasons. Any non-leaking open-ended line shall be repaired within 15 days while any leaking open-ended line shall be repaired in accordance with 95669(h) and 95669(i).

OP-10-88
cont.

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Reporting Requirements

Issue 48: Section 95672 describes reporting requirements for various source categories. As currently written, the regulation does not provide clear deadlines for reporting.

Recommendation 48: WSPA recommends that ARB add the following deadlines to Section 95672 –

(a) *Beginning January 1, 2018, owners or operators of facilities listed in section 95666 subject to requirements specified in sections 95668 and 95669 shall report the following information to ARB within the following timeframes specified:*

(1) *All annual reports described below for a calendar year must be submitted by June 30 of the following year.*

(2) *All quarterly reports described below must be submitted within 60 days from the end of a quarter.*

~~(a)~~(3) *All other reports must be submitted as specified below:*

OP-10-89

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Implementation

Issue 49: WSPA would like to re-iterate this concern that was previously submitted in letter dated March 4, 2016. Section 95673(a)(3) & (4) states the following –

(3) *Implementation and enforcement of the requirements of this subarticle by a local air district may in no instance result in a standard, requirement, or prohibition less stringent than provided for by this subarticle, as determined by the Executive Officer. The terms of any local air district permit or rule relating to this subarticle do not alter the terms of this subarticle, which remain as separate requirements for all sources subject to this subarticle.*

OP-10-90

(4) *Implementation and enforcement of the requirements of this subarticle by a local air district, including inclusion or exclusion of any of its terms within any local air district permit, or within a local air district rule, or registration of a facility with a local air district or ARB, does not in any way waive or limit ARB's authority to implement and enforce upon the requirements of this subarticle. A facility's permitting or registration status also in no way limits the ability of a local air district to enforce the requirements of this subarticle.*

OP-10-91

ARB is proposing to implement and enforce the program regardless of Air District efforts. At the same time, several Air Districts are likely to incorporate the proposed regulation by either amending their rules or adopting a separate program. WSPA is very concerned about the duplicative implementation and enforcement of the proposed regulation.

In cases where Air Districts are planning to implement the rule and are required to develop standards, requirements or prohibition that are no less stringent than provided by ARB's proposed regulation, it is unclear why ARB is proposing duplicative implementation and enforcement. Implementation of two separate programs by both ARB and the Air Districts will lead to doubling of administrative costs for the same emissions control. Additionally, operators will also need to implement two separate programs that will not only lead to confusing compliance requirements but also a doubling of their compliance costs. WSPA strongly believes that this is inefficient both in terms of costs and effectiveness of regulation. Where an Air District is implementing and enforcing the requirements of the proposed regulation, there is no need for duplicative ARB implementation and enforcement of the same requirements.

OP-10-92

Recommendation 49: WSPA strongly urges that ARB remove the duplicative implementation and enforcement requirements from the proposed regulation in Section 95673(a)(3) & (4) as follows –

(3) *Implementation and enforcement of the requirements of this subarticle by a local air district may in no instance result in a standard, requirement, or prohibition less stringent than provided for by this subarticle, as determined by the Executive Officer. The terms of any local air district permit or rule relating to this subarticle do not alter the terms of this subarticle, ~~which remain as separate requirements for all sources subject to this subarticle.~~*

OP-10-93

(4) ~~*Implementation and enforcement of the requirements of this subarticle by a local air district, including inclusion or exclusion of any of its terms within any local air district permit, or within a local air district rule, or registration of a facility with a local air district or ARB, does not in any way waive or limit ARB's authority to implement and enforce upon the requirements of this subarticle. A facility's permitting*~~

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

or registration status also in no way limits the ability of a local air district to enforce the requirements of this subarticle.

WSPA's recommendation for regulatory language is also included in Attachment A.

OP-10-93
cont.

Issue 50: Section 95673(b)(2)(A)(3)(b) requires registration of a list of certain equipment including all pressure vessels. The broad definition of "pressure vessel" would require the registration of air compressors and steam separators. This equipment contains no methane and should not be subject to this requirement. The registration should only apply to equipment with compliance requirements in the regulation.

Recommendation 50: WSPA suggests this paragraph be changed as follows:

b A list identifying all ~~separator and tank systems pressure vessels, tanks, separators, sumps, and ponds~~ at the facility, including the size of each tank and separator in units of barrels comprising the separator and tank system.

OP-10-94

Issue 51: Several other changes are necessary in the proposed regulation to provide clarity to operators on the requirements and eliminate any confusion.

Recommendation 51: WSPA's recommendations for additional changes are included in Attachment A.

OP-10-95

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

Legal Comments

Issue 52: As stated in Issue 10 above, WSPA is concerned that section 95668(a)(6) now includes a requirement that owners or operators of existing separator or tank systems with annual emissions greater than 10 metric tons per year of methane must control emissions from gauge tanks in addition to controlling emission from the separator and tank system. WSPA is concerned by the inclusion of gauge tanks, an insignificant emission source, in section 95668(a)(6) with no notice or discussion. As discussed below, none of the supporting documents provide a compelling reason to include gauge tanks in the regulation and, in fact, most of the supporting documents do not even mention gauge tanks. WSPA believes that adding gauge tanks to the proposed regulation at the last minute, without explanation, is not in accordance with the processes ARB must follow in adopting regulations.

OP-10-96

WSPA also believes that there are legal deficiencies with the supporting documents for the proposed regulation due to failure to address gauge tanks, as described below. WSPA is concerned that gauge tanks were included in the proposed regulation without conducting a comprehensive emissions and cost effectiveness analysis. WSPA believes that the minimal additional emission reductions that could be achieved by requiring gauge tanks to be controlled by a vapor collection system is outweighed by the burdensome cost to implement such controls.

OP-10-97

Recommendation 52: WSPA recommends that ARB remove gauge tanks from section 95668(a)(6) and section 95667.

OP-10-98

Issue 53: ARB's Economic Analysis for the proposed regulation does not take into account the cost to control emissions from gauge tanks with the use of a vapor collection system, as required by section 95668(a)(6). ARB states that the proposed regulation will cost about \$23 million dollars per year and is expected to reduce GHG emissions by about 1.5 million MT CO₂e per year on a 20 year horizon, for a cost per ton of approximately \$15 after savings. State of California Air Resources Board, Staff Report: Initial Statement of Reasons ("ISOR") Appendix A, Economic Analysis, p. B-2, B-7. However, these calculations do not include the cost to install vapor collection systems on all gauge tanks subject to the proposed regulation or the minimal extra emission reductions that will occur from installing such systems, as further explained in Issue 10 above. Once the extra cost and minimal benefit is included in the Economic Analysis, the proposed cost per ton of the regulation is much higher than stated in the Economic Analysis.

OP-10-99

In addition, the estimated cost to industry summarized in the Economic Analysis is also understated because it does not take into account the cost to add vapor collection systems to the gauge tanks that would be affected by the proposed regulation. See *id.* at B-12 (stating approximately \$25.4 million per year as cost). An operator with one or more upstream remote gauge tanks and a separator and tank system may have to install multiple vapor recovery systems to comply with the proposed control requirements. Therefore, the total cost could be several times the costs estimated by ARB in the Economic Analysis.

OP-10-100

ARB must include gauge tanks in the Economic Analysis in order to provide a true and accurate picture of the economic impacts of the proposed regulation. The proposed regulation includes controls on gauge tanks, as explained in the ISOR. See ISOR p. 35, 36, 57. ARB cannot ignore sections of the proposed

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

regulation in the Economic Analysis merely because they were amended after the Economic Analysis was completed. An accurate analysis which includes the cost to add vapor collection systems to gauge tanks would show that the \$15 per ton of reduction figure in the Economic Analysis is vastly understated. The high cost to control all gauge tanks coupled with the very minimal emission reductions that would result from such controls show that the proposed controls on gauge tanks in the proposed regulation are not cost-effective and mean that ARB should remove the gauge tank control requirements from the proposed regulation.

OP-10-100
cont.

Recommendation 53: WSPA recommends that ARB remove gauge tanks from the proposed regulation. If ARB does not remove gauge tanks from the proposed regulation, ARB must complete a new Economic Analysis that adequately considers the cost of the proposed regulation, taking into account the steep cost for installing vapor collection systems on gauge tanks for very minimal additional emission reductions before adopting the proposed regulation.

OP-10-101

Issue 54: ARB's Standardized Regulatory Impact Assessment ("SRIA") also has significant deficiencies as described below:

1. Gauge Tanks

The SRIA states that it is "representative of a snapshot of this regulation" and "may differ from the proposed regulation that will be presented to [ARB]." ISOR, Appendix E, Standardized Regulatory Impact Assessment, p. E-2. In fact, the SRIA does not mention gauge tanks and does not consider potential emission reductions from adding vapor collection systems to such tanks or the potential cost of such controls.

The SRIA is required to assess the potential for adverse economic impacts on California businesses and individuals, including avoiding the imposition of unnecessary or unreasonable regulations or reporting. Cal. H&S Code § 11346.3(a). The analysis is intended "to provide agencies and the public with tools to determine whether the regulatory proposal is an efficient and effective means of implementing the policy decisions enacted in statute or by other provisions of law in the least burdensome manner." *Id.*, subsection (e) (emphasis added). The regulatory impact analysis is required to compare proposed regulatory alternatives to "determine that the proposed action is the most effective, or equally effective and less burdensome, alternative in carrying out the purpose for which the action is proposed, or the most cost-effective alternative to the economy and to affected private persons that would be equally effective in implementing the statutory policy..." Cal. H&S Code § 11346.36(b).

OP-10-102

The SRIA cannot accurately determine how to control methane emissions in the "least burdensome manner" or in the most cost-effective way if it does not take into account all of the requirements in the proposed regulation. Looking at a "snapshot" of the regulation, as ARB calls it, in the SRIA does not meet the Health and Safety Code requirements for regulatory analyses. The SRIA must analyze the proposed regulation that will be in effect if the regulation is adopted as drafted, not an earlier version that would not adequately explain the true impacts of the regulation.

2. Circulation Tanks:

OP-10-103

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

The SRIA also does not consider the potential for oil and gas operations to decrease in response to the proposed regulation if it is infeasible to comply with some of the regulation's requirements. Section 95668(b)(3) requires owners or operators of circulation tanks to control emissions from the tanks with at least 95% vapor collection and control efficiency by January 1, 2020.

It is unclear whether this requirement will be feasible by 2020 as required control technology does not currently exist. The SRIA's assessment on employment, businesses, output growth, and gross state product do not consider that, if businesses cannot comply with the requirements of the proposed regulation such as section 95668(b)(3), then oil and gas production could move out of state, causing great harm to California's economy. This is a reasonably foreseeable outcome of the proposed regulation that is not addressed in the SRIA. See SRIA, p. E-19 – E-25.

OP-10-103
cont.

Recommendation 54: WSPA recommends that ARB remove gauge tanks from the proposed regulation. If ARB does not remove gauge tanks from the proposed regulation, it must complete a new SRIA that adequately considers the proposed regulation, taking into account the steep cost for installing vapor collection systems on gauge tanks for very minimal additional emission reductions before it adopts the proposed regulation.

WSPA also recommends that ARB remove control requirements for recirculation tanks from the proposed regulation due to the potential to reduce oil and gas operations in California as the proposed requirements for circulation tanks cannot be met with technology available today. If ARB does not remove circulation tanks from the proposed regulation, it must complete a new SRIA before adopting the proposed regulation which adequately considers the reasonably foreseeable outcome of the controls on recirculation tanks in the proposed regulation.

OP-10-104

Issue 55: ARB prepared the Environmental Assessment under its CEQA certified regulatory program, which requires public agencies to prepare a "functionally equivalent" or substitute document in lieu of an environmental impact report. ISOR, Appendix C, Draft Environmental Analysis for the Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (hereafter, "EA"), p. 6.

In compliance with California Public Resources Code § 21159, when ARB adopts a rule or regulation requiring the installation of pollution control equipment, or a performance standard or treatment requirement, the EA must contain "an environmental analysis of the reasonably foreseeable methods by which compliance with that rule or regulation will be achieved." The analysis must include reasonably foreseeable environmental impacts of the methods of compliance, reasonably foreseeable feasible mitigation measures related to significant impacts, and reasonably foreseeable alternative means of compliance that would avoid or eliminate significant impacts. *Id.* The EA must also assess the potential for significant adverse and beneficial environmental impacts associated with the proposed action and provide a succinct analysis of those impacts. See *generally* 14 C.C.R. § 15000 *et. seq.* ("CEQA Guidelines").

OP-10-105

Because the EA does not meet the requirements listed above for numerous reasons, it is inadequate and fails as an informational document.

- A. The EA's Project Description Is Inadequate and Fails to Inform the Public of the True Scope of the Project

OP-10-106

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

An environmental document prepared to comply with CEQA must contain a general description of the project's technical, economic, and engineering characteristic, and a statement of the objectives sought by the proposed project. CEQA Guidelines § 15124(b), (c); see *Dry Creek Citizens Coalition v. County of Tulare* (1999) 70 Cal.App. 4th 20. An accurate, stable, and finite project description is the sine qua non of an informative and legally sufficient environmental document. *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192-93.

OP-10-106
cont.

1. Gauge Tanks

Here, the EA's project description does not fully inform the public of the scope of the project. The EA's project description fails to disclose that gauge tanks are part of the proposed regulation and that the regulation will require owners and operators to install vapor collection systems on certain gauge tanks. This omission makes the analysis in the EA incomplete and inadequate. In fact, the EA does not mention gauge tanks once in the entire 100-plus page document. In explaining the proposed requirements for vapor collection on oil and water separators and tanks, the EA states that "only pressure vessels used to separate oil and water would be subject to these vapor collection requirements." EA, p. 17.

OP-10-107

An EA is required to disclose and discuss all aspects of the proposed project. Because gauge tanks are not included in the project description, this necessarily means that none of the impact analyses in the EA took gauge tanks, and the proposed controls that will be required on those tanks, into consideration. ARB must not ignore an entire area of regulation that could have potential impacts on the environment in its analysis.

In addition, reasonably foreseeable methods of compliance with the requirements for vapor collection at gauge tanks are not discussed. As described in previous comments, gauge tanks are not necessarily situated near separator and tank systems and thus potential methods of compliance for gauge tanks could differ from potential methods of compliance for separator and tank systems. This is not addressed in the EA.

OP-10-108

2. Circulation Tanks

Section 95668(b)(3) requires that by January 1, 2020, owners or operators of circulation tanks used in conjunction with well stimulation treatments shall control emissions from the tanks with at least 95% vapor control efficiency of the equipment. The EA states that reasonably foreseeable compliance responses for this requirement would be the same as those discussed for the requirements for uncontrolled oil and water separators, tanks, and sumps. EA, p. 19. However, it is unclear how disposal of vapors from circulation tanks would be conducted, as there are no currently technologies available to meet the requirements of the proposed rule.

OP-10-109

The EA states that it is reasonably foreseeable to assume that all replacement devices or newly installed vapor control devices would be low-NOx combustion devices. EA, p. 18. However, it is not clear that the various air districts in which these low-NOx combustion devices would be sited would permit them if they caused an increase in flaring, even if they are low-NOx flares. In fact, some air districts have stated that they do not want any additional flaring to occur in response to the proposed regulation. Because increased flaring and/or new flares would not be allowed without air district permitting, new combustion devices may not be a reasonably foreseeable method of compliance and ARB must address this clear conflict in the EA.

OP-10-110

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

The project description's explanation of reasonably foreseeable compliance responses to the control of vapors from uncontrolled well stimulation circulation tanks does not address the fact that it may be infeasible to meet the control requirements of the proposed regulation.

If the requirements cannot be met, operators may be required to remove equipment from service and stop operations that rely on circulation tanks. See EA, p. 42 (stating that if none of the discussed compliance options is feasible, the proposed regulation requires existing equipment to be taken out of service). For this reason, ARB must consider a reasonably foreseeable compliance response to be shutting down production in California and transferring it to other areas. This could cause numerous environmental impacts, none of which are discussed in the EA.

OP-10-110
cont.

The Department of Oil, Gas, and Geothermal Resources explained in its 2015 Draft EIR ("DEIR") titled "Analysis of Oil and Gas Well Stimulation Treatments in California" that restricting production in the state could cause numerous indirect environmental impacts. The DEIR states that "[i]n 2009, California produced almost 230 million barrels of oil from over 52,000 producing wells. That same year, California used over 600 million barrels of oil, importing 15 percent of its oil from Alaska and 45 percent from foreign sources, with Saudi Arabia (25 percent), Iraq (19 percent), Ecuador (17 percent), and Brazil (9 percent) accounting for 70 percent of the imported oil. Since 2009, the percent of foreign oil imports to California has increased to 50 percent of the oil used and imports from domestic sources other than Alaska have also increased. A loss of 25 percent of the California-produced oil would require an additional 57 million barrels per year be purchased from another source." DEIR, p. 8-9 (internal citations omitted).

OP-10-111

Because technologies do not currently exist to replace all petroleum-derived products with renewable energy, the largest portion of the lost barrels of oil would be acquired from out-of-state and would require land or sea travel to reach the California market. Thus, reducing oil production in California could cause numerous indirect effects including those from increased well abandonment and increased oil transport. These effects should be considered in the EA when a potential reasonably foreseeable compliance response to the proposed regulation is to remove equipment from service.

OP-10-112

B. The EA's Analysis of Potential Environmental Effects is Insufficient

The fundamental purpose of an environmental review document is to inform public agency decision makers and the public of the potentially significant environmental effects of a project and to identify ways to minimize or avoid those effects. CEQA Guidelines § 15121(a); *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 86. Here, the EA does not adequately analyze potential environmental impacts from the proposed regulation.

1. Air Quality

The Air Quality analysis in the EA is deficient for multiple reasons. First, short-term construction-related impacts on Air Quality (Impact 3.a) are underreported as more construction will occur than anticipated due to the addition of controls for gauge tanks in the proposed regulation. This will require the installation and replacement of gathering lines and piping, flanges, valves, low-NOx combustion devices, and other similar features associated with adding vapor collection systems to gauge tanks. Emissions from this construction are not addressed in the EA.

OP-10-113

The EA states that "ARB has not quantified the potential construction-related emission impacts as these would be too speculative to provide a useful evaluation tool" and "the specific location, type, and number

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

of construction activities is not known.” EA, p. 33. However, as explained elsewhere in the EA, ARB has counts of the systems found to be uncontrolled with methane emissions exceeding 10 metric tons per year and do not have access to an existing sales gas system, existing fuel gas system, or existing gas disposal well from a 2009 Oil and Gas Industry Survey. EA, p. 43. In addition, the Economic Analysis includes data such as the number of tanks and separator systems, continuous bleed devices, and centrifugal compressors that would be subject to the proposed regulation, along with other information on current operations. This data could be extrapolated to estimate potential construction related emissions from implementation of the proposed regulation. ARB must analyze potential impacts of the regulation in as much detail as feasible given current knowledge.

OP-10-113
cont.

In addition, as explained in the EA, one option for compliance with the proposed regulation “requires that regulated entities operating an existing vapor control device route newly collected vapors into the existing vapor collection system and then replace the existing vapor control device that would receive increased vapor throughput with a non-destructive (e.g., non-combustion) or low-NOx vapor control device.” EA, p. 41. This would be in response to proposed section 95668(c)(3) which requires existing vapor collection devices to meet the requirements of section 95668(c)(4)(B) which in turn requires existing vapor control devices in non-attainment areas to be replaced with a non-destructive device or with a low-NOx device.

OP-10-114

ARB is aware of the number of flares currently in existence which may be required to be replaced with low-NOx vapor control devices or non-destructive devices in order to comply with the proposed regulation. ARB could reasonably project anticipated construction emissions from replacing those flares with low-NOx vapor control devices or non-destructive devices. This is a reasonably foreseeable outcome of the proposed regulation as replacement of some existing vapor control devices will be required by implementation of the regulation. Thus, construction emissions from retrofitting these flares or replacing them with non-destructive control devices must be considered in the EA.

OP-10-115

The analysis of long-term operational impacts on Air Quality (Impact 3.b) is similarly deficient. As stated above, the reasonably foreseeable methods of compliance expected by ARB are unclear and / or without support in the record. ARB notes that new vapor control devices or replacement of these devices are permitted through local air districts (EA, p. 42), but does not address the distinct possibility that the local air districts may not permit any additional flaring, causing compliance with the proposed regulation to be infeasible.

OP-10-116

In addition, although “ARB anticipates that [non-combustion devices] will be used in the future” (*id.*), presumably referring to potential controls for circulation tanks in order to comply with the proposed regulation, that is not a guarantee that those devices will be available in time for the compliance deadlines in the regulation. Thus, as stated above, some production may stop due to the inability to comply with the proposed regulations which would cause indirect impacts that the EA must address and has not.

OP-10-117

Finally, ARB assumes that “the use of recovered vapors for on-site equipment fueling would lessen the amount of conventional fuels that would be combusted on-site and the need to transport those fuels to the site” (EA, p. 40). However, it is not clear that recovered vapors would be in a form sufficient to use for on-site equipment fueling. Thus, the assumption that recovered vapors could reduce fuel use and thus reduce emissions is unwarranted.

OP-10-118

There would also likely be an incremental increase in the emissions impacts reported in the EA as more gas will be routed to flares than was analyzed in the EA due to the addition of gases from the vapor

OP-10-119

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

collection systems that will be installed at certain gauge tanks in response to the requirements for controls on gauge tanks. ARB's calculation of potential emission impacts (such as emissions of NO_x and other criteria pollutants) from combustion of additional vapors collected and routed to vapor control devices as a response to the proposed regulation does not consider emissions from gauge tanks. See EA, p. 43 – 47. The additional emissions from gauge tanks will cause increased flaring which could cause increased NO_x and other criteria pollutant emissions that are not considered in the EA. ARB must correct this deficiency in order to accurately represent potential adverse emission impacts from the project.

OP-10-119
cont.

Finally, the San Joaquin Valley Air Pollution Control District ("SJVAPCD") separately estimated the change in NO_x emissions that might occur as a result of the proposed regulation and came up with ten times higher calculated emissions than ARB. EA, p. 45. It is unclear whether ARB or SJVAPCD's assumptions are correct, but the difference in estimated emissions is large enough to question ARB's calculations. One contrary assumption is that SJVAPCD assumed that captured gas would require an equal amount of supplemental make-up gas before combustion in a flare would be possible. *Id.* ARB asserts that low NO_x incinerators can handle waste gas and likely would not require additional make-up gas, and indeed the proposed regulation does not allow supplemental fuel. WSPA agrees with the SJVAPCD that, in some instances, make-up gas would be required in low NO_x incinerators and thus the proposed regulation, as written, may be infeasible in some instances. As stated above, this would result in displaced production, causing reasonably foreseeable indirect impacts that are not addressed in the EA and must be.

OP-10-120

2. Biological Resources

As in the Air Quality analysis, ARB has understated the potential construction-related impacts to special status species and habitats (Impact 4.a) due to its failure to include construction of necessary components to add vapor collection systems to gauge tanks. See *generally* EA, p. 48 – 49. This increased construction would raise the potential for impacts to biological resources and must be addressed in the EA.

OP-10-121

3. Greenhouse Gases ("GHGs")

Although the EA reports the long-term operational impacts on GHGs would be beneficial due to the reduction in methane, it also notes that there would be an increase in vehicle emissions associated with the LDAR requirements of the proposed regulation which would increase CO₂ emissions by 376 metric tons per year. EA, p. 61. This increase should be taken into consideration in Table 4-4 on p. 62, which only summarizes estimated GHG reductions from the project.

OP-10-122

4. Transportation and Traffic

The EA's analysis of transportation and traffic is superficial and purely qualitative. ARB estimated numbers of vehicle trips and potential emissions from the additional trips required for compliance with the proposed regulation in the Air Quality analysis (see, e.g., EA, p. 42 – 43) and should complete a more comprehensive, quantitative evaluation of the proposed regulation's potential impacts on transportation and traffic in the EA.

OP-10-123

Recommendation 55: WSPA recommends that ARB remove gauge tanks and recirculation tank controls from the proposed regulation. ARB must also revise and recirculate its EA so that the analysis

OP-10-124

WSPA Comments
Draft Regulation for Greenhouse Gas Emission Standards
for Crude Oil and Natural Gas Operations (June 2016)

July 18, 2016

adequately considers the potential environmental implications of all of the requirements in the regulation before it can adopt the proposed regulation.

OP-10-124
cont.

Appendix A:

PROPOSED REGULATION ORDER

California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4

(Note: The entire text of sections 95665, 95666, 95667, 95668, 95669, 95670, 95671, 95672, 95673, 95674, 95675, and 95676, set forth below is new language in “normal type” proposed to be added to title 17, California Code of Regulations.)

Adopt new Subarticle 13, and sections 95665, 95666, 95667, 95668, 95669, 95670, 95671, 95672, 95673, 95674, 95675, 95676, Appendix A, Appendix B, and Appendix C, title 17, California Code of Regulations, to read as follows:

Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

§ 95665. Purpose and Scope.

The purpose of this article is to establish greenhouse gas emission standards for crude oil and natural gas facilities identified in section 95666. This article is designed to serve the purposes of the California Global Warming Solutions Act, AB 32, as codified in sections 38500-38599 of the Health and Safety Code.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code.
Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95666. Applicability.

(a) This article applies to owners or operators of equipment and components listed in section 95668 located within California, including California waters, that are associated with facilities in the sectors listed below, regardless of emissions level:

- (1) Onshore and offshore crude oil or natural gas production; and,
- (2) Crude oil, condensate, and produced water separation and storage; and,
- (3) Natural gas underground storage; and,
- (4) Natural gas gathering and boosting stations; and,
- (5) Natural gas processing plants; and,
- (6) Natural gas transmission compressor stations.

(b) Owners and operators must ensure that their facilities, equipment, and components comply at all times with all requirements of this subarticle, including all of the

standards and requirements identified in section 95668. Owners and operators are jointly and severally liable for compliance with this subarticle.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code.
Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95667. Definitions.

(a) For the purposes of this article, the following definitions apply:

- (1) "Air district or local air district" means the local Air Quality Management District or the local Air Pollution Control District.
- (2) "Air Resources Board or ARB" means the California Air Resources Board.
- (3) "API gravity" means a scale used to reflect the specific gravity (SG) of a fluid such as crude oil, condensate, produced water, or natural gas. The API gravity is calculated as $[(141.5/SG) - 131.5]$, where SG is the specific gravity of the fluid at 60°F, and where API refers to the American Petroleum Institute.
- (4) "Centrifugal compressor" means equipment that increases the pressure of natural gas by centrifugal action.
- (5) "Centrifugal compressor seal" means a wet or dry seal around the compressor shaft where the shaft exits the compressor case.

(6) "Circulation tank" means a tank or portable tank used to circulate, store, or hold liquids or solids from a crude oil or natural gas well during or following a well stimulation treatment but prior to the well being put on production.

~~(6)~~(7) Clean Produced Water: produced water containing less than 35 milligrams per liter of VOCs as determined by EPA Test Method 413.2, 418.1 or 1664A and/or, if necessary, EPA Test Method 8240 or 8260. Ethane provided the ethane fraction of the hydrocarbon vapors is less than 20 percent by volume, and hydrocarbons heavier than C14 may be excluded from the total concentration. Water samples collected for analysis shall be collected within a five foot radius of the sump inlet. One sample shall be collected near each inlet and the results averaged.

~~(7)~~(8) "Continuous bleed" means the continuous venting of natural gas from a gas powered pneumatic device to the atmosphere. Continuous bleed pneumatic devices must vent continuously in order to operate.

~~(8)~~(9) "Crude oil" means any of the naturally occurring liquids and semi-solids found in rock formations composed of complex mixtures of hydrocarbons ranging from one to hundreds of carbon atoms in straight and branched chain rings.

See OP-10-38 in this letter

Formatted: Font: (Default) Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 0.69" + 0.69"

Formatted: Left

See OP-10-19

| ~~(9)~~(10) "Condensate" means hydrocarbon or other liquid, excluding steam, either produced or separated from crude oil or natural gas during production and which condenses due to changes in pressure or temperature.

| ~~(40)~~(11) "Commercial quality natural gas" means a mixture of gaseous hydrocarbons with at least 80 percent methane by volume and less than 10 percent by weight volatile organic compounds and meets the criteria specified in Public Utilities Commission General Order 58-A.

(11) “Component” means a valve, fitting, flange, threaded-connection, process drain, stuffing box, pressure-vacuum valve, pipes, seal fluid system, diaphragm, hatch, sight-glass, meter, open-ended line, well casing, natural gas-driven pneumatic device, natural gas-driven pneumatic pump, or natural gas reciprocating compressor rod packing or seal in methane service.

See OP-10-16

Comment [YS1]: Recommendation for clarity.

(12) “Critical component” means any component that would require the shutdown of a critical process unit if that component was shutdown or disabled.

(13) “Critical process unit” means a process unit that must remain in service because of its importance to the overall process that requires it to continue to operate, and has no equivalent equipment to replace it or cannot be bypassed, and it is technically infeasible to repair leaks from that process unit without shutting it down and opening the process unit to the atmosphere.

(14) “Crude oil and produced water separation and storage” means all activities associated with separating, storing or holding of emulsion, crude oil, condensate, or produced water at facilities to which this subarticle applies.

(15) “Emissions” means the discharge of natural gas methane into the atmosphere.

See OP-10-16

(16) “Emulsion” means any mixture of crude oil, condensate, or produced water with varying quantities of natural gas entrained in the liquids.

(17) “Equipment” means any stationary or portable machinery, object, or contrivance covered by this subarticle, as set out by sections 95666 and 95668.

(18) “Facility” means any building, structure, or installation to which this subarticle applies and which has the potential to emit natural gas methane. Facilities include all buildings, structures, or installations which:

(A) Are under the same ownership or operation, or which are owned or operated by entities which are under common control;

(B) Belong to the same industrial grouping either by virtue of falling within the same two-digit standard industrial classification code or by virtue of being part of a common industrial process, manufacturing process, or connected process involving a common raw material; and,

(C) Are located on one or more contiguous or adjacent properties.

See OP-10-16

(19) “Flash or flashing” means a process during which gas entrained in crude oil, condensate, or produced water under pressure is released when the liquids are subject to a decrease in pressure, such as when the liquids are transferred from an underground reservoir to the earth’s surface or from a pressure vessel to an atmospheric tank.

OP-10-125 (new to this letter)

Comment [YS2]: Recommendation for clarity.

- (20) "Flash analysis testing" means the determination of emissions from crude oil, condensate, and produced water by using sampling and laboratory procedures used for measuring the volume and composition of gases released from the liquids, including the molecular weight, the weight percent of individual compounds, and a gas-oil or gas-water ratio.
- (21) "Fuel gas system" means, for the purposes of this subarticle, any system that supplies natural gas as a fuel source to on-site natural gas powered equipment other than a vapor control device.
- (22) "Gas disposal well" means, for the purpose of this subarticle, any well that is used for the subsurface injection of natural gas for disposal.

~~(23) "Gauge tank" means a tank found upstream of a separator and tank system which is used for measuring the amount of liquid produced by an oil well and receives or stores crude oil, condensate, or produced water.~~

~~(24) "Global warming potential" or "GWP" means the ratio of the time-integrated radiative forcing from the instantaneous release of one kilogram of a trace substance relative to that of one kilogram of a reference gas, i.e., CO₂. For the purposes of this regulation, the GWP of Methane is 21 (SAR GWP for 100-yr Time Horizon; Table 2.14, IPCC Fourth Assessment Report: Climate Change 2007).~~

~~(25)~~ (25) "Inaccessible component" means any component located over fifteen feet above ground when access is required from the ground; or any component located over six (6) feet away from a platform or a permanent support surface when access is required from the platform.

~~(26)~~ (26) "Intermittent bleed" means the intermittent venting of natural gas from a gas powered pneumatic device to the atmosphere. Intermittent bleed pneumatic devices may vent all or a portion of their supply gas when control action is necessary but do not vent continuously.

~~(27)~~ (27) "Leak or fugitive leak" means the unintentional release of emissions at a rate greater than or equal to the leak thresholds specified in this article.

~~(28)~~ (28) "Leak detection and repair or LDAR" means the inspection of components to detect leaks of total hydrocarbons and the repair of components with leaks above the standards specified in this subarticle and within the timeframes specified in this subarticle.

~~(29)~~ (29) "Liquids unloading" means an activity conducted with the use of pressurized natural gas to remove liquids that accumulate at the bottom of a natural gas well and obstruct gas flow.

~~(30)~~ (30) "Natural gas" means a naturally occurring mixture or process derivative

See OP-10-98

Formatted: Font: (Default) Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 0.46"

Formatted: Left, Tab stops: 0.69", Left

See OP-10-12

of hydrocarbon and non-hydrocarbon gases. Its constituents include the greenhouse gases methane and carbon dioxide, as well as heavier hydrocarbons. Natural gas may be field quality (which varies widely) or pipeline quality.

~~(30)~~(31) "Natural gas gathering and boosting station" means all equipment and components located within a facility fence line associated with moving natural gas to a **natural gas** processing plant or natural gas transmission pipeline.

OP-10-126

Comment [YS3]: Recommendation to clarify the type of processing plant.

~~(34)~~(32) "Natural gas processing plant" means a plant used for the separation of natural gas liquids (NGLs) or non-methane gases from produced natural gas, or the separation of NGLs into one or more component mixtures.

~~(32)~~(33) "Natural gas transmission compressor station" means all equipment and components located within a facility fence line associated with moving natural gas from production fields or natural gas processing plants through natural gas transmission pipelines.

~~(33)~~(34) "Natural gas transmission pipeline" means a state rate-regulated intrastate pipeline, or a pipeline that falls under the "Hinshaw Exemption" as referenced in section 1(c) of the Natural Gas Act, 15 U.S.C. 717-717z (2015).

~~(34)~~(35) "Natural gas underground storage" means all equipment and components associated with the temporary subsurface storage of natural gas in depleted crude oil or natural gas reservoirs or salt dome caverns. Natural gas storage does not include gas disposal wells.

~~(35)~~(36) "Offshore" means all marine waters located within the boundaries of the State of California.

~~(36)~~(37) "Onshore" means all lands located within the boundaries of the State of California.

~~(37)~~(38) "Operator" means any entity, including an owner or contractor, having operational control of components or equipment, including leased, contracted, or rented components and equipment to which this subarticle applies.

OP-10-127

~~(38)~~(39) "Owner" means the entity that owns **or operates** components or equipment to which this subarticle applies.

Comment [YS4]: Operator definition already included above.

~~(39)~~(40) "Photo-ionization detector or PID instrument" means a gas detection device that utilizes ultra-violet light to ionize gas molecules and is commonly employed in the detection of non-methane volatile organic compounds.

~~(40)~~(41) "Pneumatic device" means an automation device that uses natural gas, compressed air, or electricity to control a process.

~~(41)~~(42) "Pneumatic pump" means a device that uses natural gas or compressed air to power a piston or diaphragm in order to circulate or pump liquids.

(42)(43) "Pond" means any very large excavation that is used for the storage and or disposal of clean produced water (as defined in San Joaquin Air Pollution Control District Rule 4402), is not used for the separation of oil and water, and has no more than five percent visible oil-covered surface area. Steam blowdown pits are not ponds.~~an excavation or impoundment for the storage and disposal of produced water and which is not used for crude oil separation or processing.~~

See OP-10-19

Formatted: Font: Not Italic

(43)(44) "Portable equipment" means equipment designed for, and capable of, being carried or moved from one location to another and which it resides for less than 365 days. Portability indicators include, but are not limited to, the presence of wheels, skids, carrying handles, dolly, trailer, or platform.

(44)(45) "Portable pressurized separator" means a pressure vessel that can be moved from one location to another by attachment to a motor vehicle without having to be dismantled and is capable of separating and sampling crude oil, condensate, or produced water at the steady-state temperature and pressure of the separator required for sampling.

(45)(46) "Portable tank" means a tank that can be moved from one location to another by attachment to a motor vehicle without having to be dismantled.

(46)(47) "Pressure separator" means a pressure vessel used for the primary purpose of separating crude oil and produced water or for separating natural gas and produced water.

(47)(48) "Pressure vessel" means any a hollow container used to hold gas or liquid and rated, as indicated by an ASME pressure rating stamp, and operated to contain normal working pressures of at least 15 psig without continuous vapor loss to the atmosphere.

See OP-10-20

(48)(49) "Production" means all activities associated with the production or recovery of emulsion, crude oil, condensate, produced water, or natural gas at facilities to which this subarticle applies.

(49)(50) "Produced water" means water recovered from an underground reservoir as a result of crude oil, condensate, or natural gas production and which may be treated and used for irrigation, recycled, disposed, or re-injected into an underground reservoir.

OP-10-128

Comment [YS5]: To include examples of other uses of produced water.

(50)(51) "Reciprocating natural gas compressor" means equipment that increases the pressure of natural gas by positive displacement of a piston in a compression cylinder and is powered by an internal combustion engine or electric motor with a horsepower rating supplied by the manufacturer.

(51)(52) "Reciprocating natural gas compressor rod packing" means a seal comprising of a series of flexible rings in machined metal cups that fit around

the reciprocating compressor piston rod to create a seal limiting the amount of compressed natural gas that vents into the atmosphere.

(52)(53) "Reciprocating natural gas compressor seal" means any device or mechanism used to limit the amount of natural gas that vents from a compression cylinder into the atmosphere.

(53)(54) "Separator" means any tank or pressure separator used for the primary purpose of separating natural gas, crude oil and produced water or for separating natural gas, condensate, and produced water. In crude oil production a separator may be referred to as a Wash Tank or as a three-phase separator. In natural gas production a separator may be referred to as a heater/separator.

Comment [YS6]: Recommendation based on clarity received from ARB.

OP-10-129

(54) "Separator and tank system" means the first separator in a crude oil or natural gas production system and any tank ~~or sump~~ connected directly to the first separator.

See OP-10-18

Formatted: Font: (Default) Arial, 12 pt

(55) "Successful repair" means tightening, adjusting, or replacing equipment or a component for the purpose of stopping or reducing fugitive leaks below the minimum leak threshold or emission flow rate standard specified in this subarticle.

(56) "Sump" means a lined or unlined surface impoundment or excavated depression in the ground ~~that which~~, during normal operations, is in continuous use ~~for~~ separating, ~~store, or hold emulsion,~~ crude oil, ~~condensate, or~~ produced water, and solids in oil producing fields.

See OP-10-17

(57) "Tank" means any container constructed primarily of non-earthen materials used for the purpose of storing, holding, or separating emulsion, crude oil, condensate, or produced water and that is designed to operate below 15 psig normal operating pressure.

(58) Unmanned Facility: a facility which has no permanent-sited operators. Permanent-sited operators means personnel responsible for the operation of the equipment subject to this rule are in attendance at the facility 24 hours per day.

Formatted: Font: (Default) Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 0.44"

See OP-10-74

(57)(59) Manned Facility: a facility that does not meet the definition of an unmanned facility.

Formatted: Left, Indent: Left: 0.69", No bullets or numbering

Formatted: Left

(58)(60) "Unsafe-to-Monitor Components" means components installed at locations that would prevent the safe inspection or repair of components as defined by OSHA standards or in provisions for worker safety found in 29 CFR 1910.

(59)(61) "Vapor collection system" means equipment and components installed on pressure vessels, separators, tanks, or sumps including piping, connections, and flow-inducing devices used to collect and route emissions-methane to a processing, sales gas, or fuel gas system; to a gas disposal well;

See OP-10-16

or to a vapor control device.

| ~~(60)~~(62) “Vapor control device” means destructive or non-destructive equipment
used with the primary purpose to control emissions.

| ~~(64)~~(63) “Vapor control efficiency” means the ability of a vapor control device
to control emissions, expressed as a percentage, which can be estimated by
calculation or by measuring the total hydrocarbon concentration at the inlet
and outlet of the vapor control device.

See OP-10-21

~~(62)~~(64) "Vent or venting" means the intentional or automatic release of natural gas into the atmosphere from components, equipment or activities described in this subarticle.

~~(63)~~(65) "Well" means a boring in the earth that is designed to bring emulsion, crude oil, condensate, produced water, or natural gas to the surface, or to inject natural gas into underground storage.

~~(64)~~(66) "Well casing vent" means an opening on a well head that blocks or allows natural gas to flow to the atmosphere or to a vapor collection system.

~~(65)~~(67) "Well stimulation treatment" means the treatment of a well designed to enhance crude oil and natural gas production or recovery by increasing the permeability of the formation and as further defined by the Division of Oil, Gas, and Geothermal Resources SB 4 Well Stimulation Treatment Regulations, Chapter 4, Subchapter 2, Article 2, section 1761(a) (December 30, 2014).

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code.
Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code

§ 95668. Standards.

The following standards apply at all times to facilities listed in section 95666. The availability of an exemption for any particular component or facility, or compliance with one of the standards, does not exempt the owner or operator of a facility from complying with other standards for equipment or processes located at a facility.

(a) Separator and Tank Systems

(1) Except as provided in section 95668(a)(2), the following requirements apply to separator and tank systems located at facilities listed in section 95666.

(2) The requirements of section 95668(a) do not apply to the following:

(A) Separator and tank systems or any tanks that receive less than 1050 barrels of crude oil or condensate per day and or that receive less than 1,0200 barrels of produced water per day.

(B) Separator and tanks systems that are controlled with the use of a vapor collection system as of January 1, 2018,

~~(B)(C)~~ Separator and tank systems or any tanks that receive liquids from wells that have an API gravity of 20 or lower.

~~(C)(D)~~ Separators, tanks, and sumps that have ~~not~~ contained crude oil, condensate, or produced water for at least no more than a total of 4530 calendar days or 1,080 hours during a

See OP-10-27

OP-10-130

Formatted: Font: (Intl) Arial

Formatted: Font: (Default) Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 1.07"

See OP-10-28

See OP-10-30

calendar year.

(E) Tanks with a capacity of 300 bbls or smaller.

(F) Tanks used for temporarily separating, storing, or holding liquids from any newly constructed well for up to 90 calendar days following initial production from that well ~~provided that the tank is not used to circulate liquids from a well that has been subject to a well stimulation treatment.~~ This does not include circulation tanks used in conjunction with well stimulation treatments.

See OP-10-30

See OP-10-29

Formatted: Font: (Intl) Arial

Formatted: Font: Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 1.07"

See OP-10-32

Formatted: Indent: Left: 1.07"

~~(E)(G)~~ Tanks used for temporarily separating, storing, or holding liquids from wells undergoing rework, maintenance, or inspection for up to 90 calendar days. provided they are not used to circulate liquids from a well that has been subject to a well stimulation treatment. This does not include circulation tanks used in conjunction with well stimulation treatments.

See OP-10-32

(H) Tanks that recover less than 10 gallons-barrels per day of any petroleum product from equipment provided that the owner or operator maintains, and can make available at the request of the ARB Executive Officer, a record of the amount of liquid recovered.

See OP-10-31

(3) By January 1, 2018, owners or operators of existing separator and tank systems that are not controlled for emissions with the use of a vapor collection system shall conduct flash analysis testing of the crude oil, condensate, or produced water processed, stored, or held in the system.

See OP-10-34

(3) (A) An operator may forego the January 1, 2018 flash analysis testing requirement and instead elect to install vapor recovery system on a separator and tank system as specified in 95668(a)(6). In order to comply, the owner or operator must submit permit applications to the local Air District by January 1, 2018.

(4) Beginning January 1, 2018, owners or operators of new separator and tank systems that are not controlled for emissions with the use of a vapor collection system shall conduct flash analysis testing of the crude oil, condensate, or produced water processed, stored, or held in the system within 90 days of initial system startup.

(5) Flash analysis testing shall be conducted as follows:

- (A) Testing shall be conducted in accordance with the ARB Test Procedure for Determining Annual Flash Emission Rate of Methane from Crude Oil, Condensate, and Produced Water as described in Appendix C.
- (B) Testing shall be conducted so that no crude oil, condensate, or produced water is diverted through a gauge tank that is open to the atmosphere and located upstream of the separator and tank system while testing is conducted.
- (C) Calculate the annual methane emissions for the crude oil, condensate, and produced water using the test results provided by the laboratory.
- (D) Sum the annual methane emissions for the crude oil, condensate, and produced water.
- (E) Maintain a record of flash analysis testing as specified in section 95671 and report the results to ARB as specified in section 95672.

Formatted: Font: (Intl) Arial

Formatted: Indent: Left: 0.82", No bullets or numbering

Formatted: Font: (Default) Arial, 12 pt

Formatted: List Paragraph, Right, Indent: Left: 0.82", Right: 0.18", Tab stops: 0.82", Left

Formatted: Font: (Intl) Arial

Formatted: Font: (Default) Arial, 12 pt

Formatted: Normal, Left, No bullets or numbering

Formatted: Font: Not Italic

Formatted: List Paragraph, Indent: Left: 0.32"

Formatted: Font: (Default) Arial, 12 pt

Formatted: Font: (Default) Arial, 12 pt, Font color: Red

Formatted: Font: (Default) Arial, 12 pt

Formatted: List Paragraph, Right, Indent: Left: 1.07"

- (F) The ARB Executive Officer may request additional flash analysis testing or information in the event that the test results reported do not reflect representative results of similar systems.

(G) Operators of a separator and tank system may perform additional flash analysis testing in a year and use the average of the test results to determine the need for addition of a vapor collection system as specified in 95668(a)(6).

See OP-10-35

Formatted: List Paragraph, Left, Numbered + Level: 3 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0.69" + Indent at: 1.07"

(6) By January 1, 2019, owners or operators of an existing separator and tank system with an annual emission rate greater than 100 metric tons per year of methane shall control the emissions from the separator and tank system ~~and uncontrolled gauge tanks located upstream of the separator and tank system~~ with the use of a vapor collection system as specified in section 95668(c).

(7) Beginning January 1, 2018, owners or operators of new separator and tank systems with an annual emission rate greater than 100 metric tons per year of methane shall control the emissions from the separator and tank system ~~and uncontrolled gauge tanks located upstream of the separator and tank system~~ with the use of a vapor collection system as specified in section 95668(c) within ~~180 days~~24 months of conducting flash analysis testing.

~~(7)~~(8) Beginning January 1, 2019, owners or operators of existing separator and tank systems that exceed the annual emission rate of 100 metric tons per year of methane shall control the emissions from the separator and tank system with the use of a vapor collection system as specified in section 95668(c) within 24 months of conducting flash analysis testing.

~~(8)~~(9) Beginning January 1, 2019, owners or operators of a separator and tank system with an annual emission rate less than or equal to 100 metric tons per year of methane shall conduct flash analysis testing and reporting annually. If the results of three consecutive years of test results show that the system has an annual emission rate of less than or equal to 100 metric tons per year of methane the owner or operator may reduce the frequency of testing and reporting to once every five years.

(A) After the third consecutive year of testing, if the annual crude oil, condensate, or produced water throughput increases by more than 20 percent after one year from the date of previous flash analysis testing, then the annual methane emissions shall be recalculated using the laboratory reports from previous flash analysis testing.

(B) The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, a record of the revised flash emission calculation as specified in Appendix A, Table A1 and shall report the results to ARB within 90 days as specified in section 95672 of this subarticle.

(b) Circulation Tanks for Well Stimulation Treatments

(1) ~~Beginning~~Beginning January 1, 2018, owners or operators of circulation tanks used in conjunction with well stimulation treatments at facilities listed in section 95666 shall implement a best practices management plan that is designed to limit methane emissions from circulation tanks, and shall ~~provide~~make that plan available to ARB upon request. Each plan must contain a list of best practices, ~~identified on the basis of substantial evidence recorded in the plan,~~ to address

See OP-10-37
and
OP-10-98

Formatted: Font: (Intl) Arial

Formatted: Font: (Default) Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 0.71"

See OP-10-39

the following issue areas:

- (A) Inspection practices to minimize emissions from circulation tanks.
- (B) Practices to reduce venting of emissions from circulation tanks.
- (C) Practices to minimize the duration of liquid circulation.
- (D) Alternative practices to control vented and fugitive emissions.

~~(2) By January 1, 2019, An~~ owners or operators of circulation tanks used in conjunction with well stimulation treatments beginning January 1, 2018 at the owner or operator's wells, shall conduct testing of control technologies that are available as of January 1, 2017 and determined by the operator to meet the operator's environmental and safety standards.

Formatted: Font: (Int'l) Arial

Formatted: Indent: Left: 0.69", No bullets or numbering

~~(2)(3) A written report including the detailed results of each test or a group of tests must be provided to the ARB Executive Officer by January 1, 2019. with a written report that details the results of equipment used to control emissions from circulation tanks with at least 95% vapor collection and control efficiency.~~

See OP-10-59

(A) The report shall include the results of testing conducted by the owner or operator or equipment manufacturers that ~~demonstrate~~ describe the measured vapor collection and control efficiency of the equipment including the disposition of collected vapors.

Formatted: Not Expanded by / Condensed by

Formatted: Font: Not Italic

Formatted: Font: (Int'l) Arial

Formatted: Font: Not Italic

Formatted: Left

Formatted: Font: Not Italic

~~(A)(B) The ARB Executive Officer will evaluate the results of testing to determine control requirements on circulation tanks and will re-evaluate this section beyond 2020.~~

Formatted: Left, Right: 0.31", Tab stops: 0.69", Left + 0.69", Left

~~(4) By January 1, 2020, owners or operators of circulation tanks used in conjunction with well stimulation treatments shall control emissions from the tanks with at least 95% vapor collection and control efficiency.~~

Formatted: Font: (Default) Arial, 12 pt

~~(3)~~

Formatted: Normal, Left, Indent: Left: 0.32", No bullets or numbering

(c) Vapor Collection Systems and Vapor Control Devices

(1) Beginning January 1, 2019, the following requirements apply to equipment at facilities listed in section 95666 that are subject to the vapor collection system and control device requirements specified in this subarticle:

(2) Unless section 95668(c)(3) applies, the vapor collection system shall safely direct the collected vapors to one of the following until system capacity is reached:

- (A) Existing sales gas system; or,
- (B) Existing fuel gas system; or,
- (C) Existing gas disposal well not currently under review by the Division of Oil and Gas and Geothermal Resources.

(3) If no safe existing sales gas system, fuel gas system, or gas disposal well specified in section 95668(c)(2) is available at the facility or the existing system reaches capacity, the owner or operator must control the collected vapors as follows:

See OP-10-61

(A) For facilities without an existing vapor control device installed at the facility:

Formatted: Font: (Int'l) Arial

1. The owner or operator must install a new vapor control device that

Formatted: Left

achieves at least 95% vapor control efficiency and incorporates Best Available Control Technology as defined and determined by the local air district for NOx; or

~~(A)~~2. The owner or operator must install a new vapor control device as specified in section 95668(c)(4). ~~or,~~

(B) For facilities currently operating a vapor control device and which are required to control additional vapors as a result of this subarticle:

1. ~~the owner or operator must demonstrate to the local air district that an existing vapor control device achieves at least 95% vapor control efficiency and incorporates best available control technology as defined and determined by the local air district for NOx; or~~

~~(B)~~2. The owner or operator must replace the existing vapor control device with a new vapor control device as specified in section 95668(c)(4) to control all of the collected vapors, if the device does not already meet the requirements specified in section 95668(c)(4).

(4) Any vapor control device required in section 95668(c)(3) must meet the following requirements:

Formatted: Font: (Intl) Arial

See OP-10-61

Formatted: Font: (Intl) Arial

Formatted: Left

Formatted: Font: (Intl) Arial

(A) If the vapor control device is to be installed in a region classified as in attainment with all state and federal ambient air quality standards, the vapor control device must achieve at least 95% vapor control efficiency of total emissions and must meet all applicable federal, state, and local air district requirements; or,

(B) If the vapor control device is to be installed in a region classified as non-attainment with, or which has not been classified as in attainment of, all state and federal ambient air quality standards, the owner or operator must install one of the following devices that meets all applicable federal, state, and local air district requirements:

1. A non-destructive vapor control device that achieves at least 95% vapor control efficiency of total emissions and does not result in emissions of nitrogen oxides (NOx); or,
2. A vapor control device that achieves at least 95% vapor control efficiency of total emissions and does not generate more than 15 parts per million volume (ppmv) NOx when measured at 3% oxygen ~~and does not require the use of supplemental fuel gas, other than gas required for a pilot burner, to operate.~~

See OP-10-62

(5) If the collected vapors cannot be controlled as specified in section 95668(c)(2) through (4), the equipment subject to the vapor collection and control requirements specified in this subarticle may not be used or installed and must be removed from service by ~~January 1, 2018~~ the date when the vapor collection system is required in this subarticle.

See OP-10-65

(6) Vapor collection systems and control devices are allowed to be taken out of service for up to ~~630~~ calendar days per year for performing maintenance. A time extension to perform maintenance not to exceed 14 calendar days may be granted by the ARB Executive Officer. The owner or operator is responsible for maintaining a record of the number of calendar days per calendar year that the vapor collection system or vapor control device is out of service and shall provide a record of such activity at the request of the ARB Executive Officer.

See OP-10-66

(A) If an alternate vapor control device compliant with this section is installed prior to conducting maintenance and the vapor collection and control system continues to collect and control vapors during the maintenance operation consistent with the applicable standards specified in section 95668(c)(4), the event does not count towards the ~~630~~ calendar day limit.

(B) Vapor collection system and control device shutdowns that result from utility power outages are not subject to enforcement action provided the equipment resumes normal operation as soon as normal utility power is restored. Vapor collection system and control device shutdowns that result

from utility power outages do not count towards the ~~630~~ 60 calendar day limit for maintenance.

See OP-10-66

(d) *Reciprocating Natural Gas Compressors*

- (1) Except as provided in section 95668(d)(2), the following requirements apply to reciprocating natural gas compressors located at facilities listed in section 95666.
- (2) The requirements of section 95668(d) do not apply to the following:
 - (A) Reciprocating natural gas powered compressors that operate less than 200 hours per calendar year provided that the owner or operator maintains, and makes available upon request by the ARB Executive Officer a record of the operating hours per calendar year.
- (3) The following requirements apply to reciprocating natural gas compressors located at crude oil or natural gas production facilities and are not covered under section 95668(d)(4):
 - (A) Beginning January 1, 2018, components on driver engines and compressors shall comply with the leak detection and repair requirements specified in section 95669; and,
 - (B) The compressor rod packing or seal shall be tested during each inspection period in accordance with the leak detection and repair requirements specified in section 95669 while the compressor is running at normal operating temperature.
 - (C) Beginning January 1, 2019, compressor vent stacks used to vent rod packing or seal emissions shall be controlled with the use of a vapor collection system as specified in section 95688(c); or,
 - (D) A compressor with a rod packing or seal leak concentration measured above the minimum leak threshold specified in section 95669 shall be successfully repaired within 30 calendar days from the date of initial measurement.
 - (E) The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, a record of a rod packing leak concentration measurement found above the minimum leak threshold as specified in Appendix A, Table 5 and shall report the results to ARB once per calendar year as specified in section 95672 of this subarticle.
 - (F) A reciprocating natural gas compressor with a rod packing or seal leak concentration measured above the minimum standard specified in

section 95669 and which has been approved by the ARB Executive Officer as a critical component as specified in section 95670, shall be successfully repaired by the end of the next process shutdown or within 12 months from the date of the initial leak concentration measurement, whichever is sooner.

- (4) The following requirements apply to reciprocating natural gas compressors at natural gas gathering and boosting stations, processing plants, transmission compressor stations, and underground natural gas storage facilities listed in section 95666 and which are not covered under section 95668(d)(3):
- (A) Beginning January 1, 2018, components on driver engines and compressors shall comply with the leak detection and repair requirements specified in section 95669; and,
- (B) The compressor rod packing or seal emission flow rate through the rod packing or seal vent stack shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature using one of the following methods:
1. Flow rates measured annually as per the methods described in Greenhouse Gas Mandatory Reporting Regulation Section 95153(n); or,
 - ~~4.2.~~ Vent stacks shall be equipped with a meter or instrumentation to measure the rod packing or seal emissions flow rate; or,
 - ~~2.3.~~ Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six (6) feet above ground level or a permanent support surface for making individual or combined rod packing or seal emission flow rate measurements.
- (C) Beginning January 1, 2019, compressor vent stacks used to vent rod packing or seal emissions shall be controlled with the use of a vapor collection system as specified in section 95668(c); or,
- (D) A compressor with a rod packing or seal with a measured emission flow rate greater than two (2) standard cubic feet per minute (scfm), or a combined rod packing or seal emission flow rate greater than the number of compression cylinders multiplied by two (2) scfm, shall be successfully repaired within 30 calendar days from the date of the initial emission flow rate measurement.
- (E) The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, a record of the flow rate measurement as specified in Appendix A, Table A7 and shall report the result to ARB once

See OP-10-67

Formatted: Font:

Formatted: Font: (Intl) Arial

Formatted: Right, Indent: Left: 1.15", No bullets or numbering

per calendar year as specified in section 95672 of this subarticle.

- (F) A reciprocating natural gas compressor with a rod packing or seal emission flow rate measured above the standard specified in section 95688(d)(4)(D) and which has been ~~approved by the ARB Executive Officer identified~~ as a critical component as specified in section 95670, shall be successfully repaired by the end of the next process shutdown or within 12 months from the date of the initial flow rate measurement, whichever is sooner.

OP-10-131

(e) *Centrifugal Natural Gas Compressors*

- (1) Except as provided in section 95668(e)(2), the following requirements apply to centrifugal natural gas compressors located at facilities listed in section 95666.
- (2) The requirements of section 95668(e) do not apply to the following:
 - (A) Centrifugal natural gas powered compressors that operate less than 200 hours per calendar year provided that the owner or operator maintains, and can make available upon request by the ARB Executive Officer, a record of the operating hours per calendar year.
- (3) Beginning January 1, 2018, components on driver engines and compressors that use a wet seal or a dry seal shall comply with the leak detection and repair requirements specified in section 95669; and,
- (4) Centrifugal compressor wet seals shall be measured annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument) while the compressor is running at normal operating temperature in order to determine the wet seal emission flow rate using one of the following methods:

(A) Flow rates measured annually as per the methods described in Greenhouse Gas Mandatory Reporting Regulation Section 95153(m); or,

~~(A)~~(B) Vent stacks shall be equipped with a meter or instrumentation to measure the wet seal emissions flow rate; or,

~~(B)~~(C) Vent stacks shall be equipped with a clearly identified access port installed at a height of no more than six (6) feet above ground level or a permanent support surface for making wet seal emission flow rate measurements.

- (5) Beginning January 1, 2019, centrifugal compressors with wet seals shall control the wet seal vent gas with the use of a vapor collection system as described in section 95668(c); or,
- (6) A compressor with a wet seal emission flow rate greater than three (3) scfm, or a combined flow rate greater than the number of wet seals multiplied by three

See OP-10-67

Formatted: Font:

Formatted: Font: (Intl) Arial

Formatted: Indent: Left: 1.07", No bullets or numbering

(3) scfm, shall be successfully repaired within 30 calendar days of the initial flow rate measurement; or,

- (7) Replace the wet seal with a dry seal by no later than January 1, 2020.
- (8) The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, a record of the flow rate measurement as specified in Appendix A, Table A7 and shall report the result to ARB once per calendar year as specified in section 95672 of this subarticle.
- (9) A centrifugal natural gas compressor with a wet seal emission flow rate measured above the standard specified in section 95668(e)(6) and which has been ~~approved by the ARB Executive Officer~~ identified as a critical component as specified in section 95670, shall be successfully repaired by the end of the next process shutdown or within 12 months from the date of the initial flow rate measurement, whichever is sooner.

OP-10-132

(f) *Natural Gas Powered Pneumatic Devices and Pumps*

- (1) The following requirements apply to natural gas powered pneumatic devices and pumps located at facilities listed in section 95666:
- (2) By January 1, 2019, continuous bleed natural gas pneumatic devices shall not vent natural gas to the atmosphere and shall comply with the leak detection and repair requirements specified in section 95669.
 - (A) Continuous bleed natural gas powered pneumatic devices installed prior to January 1, 2016 may be used provided they meet all of the following requirements ~~beginning January 1, 2019~~:
 - 1. No device shall vent natural gas at a rate greater than 6 standard cubic feet per hour (scfh).
 - 2. All devices are clearly marked with a permanent tag that identifies the natural gas flow rate as less than or equal to 6 scfh.
 - 3. All devices are tested annually using a direct measurement method (high volume sampling, bagging, calibrated flow measuring instrument); and,
 - 4. Any device with a measured emissions flow rate greater than 6 scfh shall be successfully repaired within 14 calendar days from the date of the initial emission flow rate measurement.
 - 5. The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, a record of the flow rate measurement as specified in Appendix A, Table A7 and shall report the result to ARB once per calendar year as specified in section 95672 of this subarticle.

OP-10-133

Comment [YS7]: Recommendation based on clarification received from ARB

(3) Beginning January 1, 2018, intermittent bleed pneumatic devices shall comply with the leak detection and repair requirements specified in section 95669 when the device is idle and not controlling.

(4) By January 1, 2019, pneumatic pumps shall not vent natural gas to the atmosphere and shall comply with the leak detection and repair requirements specified in section 95669.

(5) ~~Continuous bleed P~~natural gas-powered pneumatic devices installed after January 1, 2016 and pumps which need to be replaced or retrofitted to comply with the requirements specified in section 95668(f) shall do so by one of the following methods by January 1, 2019:

(A) Collect all vented natural gas with the use of a vapor collection system as specified in section 95668(c); or,

(B) Use compressed air or electricity to operate.

(g) *Liquids Unloading of Natural Gas Wells*

(1) Beginning January 1, 2018, owners or operators of natural gas wells at facilities listed in section 95666 that are vented to the atmosphere for the purpose of liquids unloading shall perform one of the following:

(A) Collect the vented natural gas with the use of a vapor collection system as specified in section 95668(c); or,

(B) Measure the volume of natural gas vented by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument); or,

(C) Calculate the volume of natural gas vented using the Liquid Unloading Calculation listed in Appendix B or according to the Air Resources Board Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Title 17, Division 3, Chapter 1, Subchapter 10, Article 2, Section 95153(e) (February, 2015); and,

(D) Record the volume of natural gas vented and specify the calculation method used or specify if the volume was measured by direct measurement as specified in Appendix A, Table A2.

(2) Owners or operators shall maintain, and make available upon request by the ARB Executive Officer, a record of the volume of natural gas vented to perform liquids unloading as well as equipment installed in the natural gas well(s) designed to automatically perform liquids unloading (e.g., foaming agent, velocity tubing, plunger lift, etc.) as specified in Appendix A, Table A2 and shall report the results to ARB once per calendar year as specified in section 95672 of this subarticle.

OP-10-134

Comment [YS8]: Recommendation based on clarification received from ARB

(h) Well Casing Vents

(1) Beginning January 1, 2018, owners or operators of wells located at facilities listed in section 95666 with a well casing vent that is open to the atmosphere shall comply with one of the following requirements –

(A) ~~Measure~~ Measure the natural gas flow rate from the well casing vent annually by direct measurement (high volume sampling, bagging, calibrated flow measuring instrument); or ~~and~~,

(B) Calculate the volume of natural gas vented according to the Air Resources Board Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, Title 17, Division 3, Chapter 1, Subchapter 10, Article 2, Section 95153(k) (February, 2015).

(2) The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, a record of each well casing vent flow rate measurement as specified in Appendix A, Table 7 and shall report the results to ARB once per calendar year as specified in section 95672 of this subarticle.

(i) Natural Gas Underground Storage Facility Monitoring Requirements

(1) As of the effective date of this subarticle, owners or operators of natural gas underground storage facilities listed in section 95666 that have a leak detection protocol approved by the Department of Conservation Division of Oil, Gas, and Geothermal Resources shall continue to implement that plan until a plan approved under this subarticle is in place. Then, by January 1, 2018, owners or operators of natural gas underground storage facilities listed in section 95666 shall submit to ARB a monitoring plan that contains equipment specifications and procedures used to perform the following types of monitoring at the facility:

- (A) Continuous monitoring of the ambient air at the facility for emissions of natural gas in conjunction with a monitoring system that can be accessed remotely by the ARB and other state or local agencies specified by the ARB Executive Officer.
- (B) Daily screening of each natural gas injection/withdrawal wellhead assembly, attached pipelines, and the surrounding area within a 200 foot radius of the wellhead assembly for leaks of natural gas. The facility may propose to perform daily leak screening with the use of US EPA Method 21 (which is incorporated herein by reference), Optical Gas Imaging (OGI), or other screening instruments; or,
- (C) Continuous monitoring of each natural gas injection/withdrawal wellhead assembly, attached pipelines, and the surrounding area within a 200 foot radius of the wellhead assembly for leaks of natural gas with the use of a monitoring and alarm system that is both audible and visible in the control

Formatted: Font: (Intl) Arial

Formatted: Indent: Left: 0.69", No bullets or numbering

Formatted: Left, Indent: Left: 0.69", No bullets or numbering

See OP-10-68

room and at remote control centers.

1. The alarm system shall be triggered any time a leak is detected.
2. The alarm system shall be triggered in the event of a sensor failure.

3. The monitoring system shall use a data logging system with the ability to store at least two (2) years of continuous monitoring data.
 4. Quarterly, the alarm system shall be tested to ensure that the system and sensors are functioning properly. Any defective instrumentation shall be repaired or replaced within 14 calendar days from the date of alarm system testing.
 5. At least annually, all sensors shall be calibrated as specified by the equipment manufacturer. Any defective instrumentation shall be repaired or replaced within 14 calendar days from the date of calibration.
 6. The owner or operator shall maintain, and make available upon request by the ARB Executive Officer, records of monitoring system data, records of calibration, and records of alarm system testing.
- (2) By March 1, 2018, the ARB Executive Officer will approve in full or in part, or disapprove in full or in part, a monitoring plan based on whether it is sufficient to meet the requirements specified in section 95668(i)(1).
 - (3) Beginning September 1, 2018, owners or operators of natural gas underground storage facilities listed in section 95666 shall monitor each facility according to the monitoring plan specified in 95668(i)(1) that has been fully approved by the ARB Executive Officer; and,
 - (4) All leaks detected at each natural gas injection/withdrawal wellhead assembly during daily leak inspections or as indicated with the use of a continuous system shall be measured for leaks of total hydrocarbons in units of parts per million volume (ppmv) calibrated as methane in accordance with EPA Reference Method 21 excluding the use of PID instruments within 24 hours of initial leak detection; and,
 - (5) All leaks shall be successfully repaired within the repair timeframes specified for each leak threshold as specified in section 95669 of this subarticle; and,
 - (6) At any time is leak is measured above the maximum leak threshold specified in section 95669 during leak inspections conducted at each natural gas injection/withdrawal wellhead assembly, attached pipelines, and the surrounding area within a 200 foot radius of the wellhead, or at any time an air monitoring system detects levels of natural gas that exceed more than 10 percent of baseline conditions, the owner or operator shall notify the ARB, the Department of Oil, Gas, and Geothermal Resources, and the local air district within 24 hours to report the emissions measurement as specified in 95672 of this subarticle; and,

- (7) Owners or operators shall maintain, and make available upon request by the ARB Executive Officer, a record of the initial and final leak concentration measurement for leaks identified during daily inspections or identified by a continuous leak monitoring system and measured above the minimum allowable leak threshold as specified in Appendix A Table A5; and,
- (8) Owners or operators shall report the results of the initial and final leak concentration measurement for leaks identified during daily inspections or identified by a continuous leak monitoring system and measured above the minimum allowable leak threshold once per calendar quarter as specified in section 95672 of this subarticle.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code.
Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code

§ 95669. Leak Detection and Repair.

- (a) Except as provided in section 95669(b), the following leak detection and repair requirements apply to facilities listed in section 95666.
- (b) The requirements of this section do not apply to the following:
 - (1) Components, including components found on tanks, separators, and pressure vessels that are subject to local air district leak detection and repair requirements prior to January 1, 2018.
 - (2) Components, including components found on tanks, separators, and pressure vessels used exclusively for crude oil with an API Gravity less than 20.
 - (3) Components incorporated into produced water lines located downstream of a separator and tank system that is controlled with the use of a vapor collection system.
 - (4) Natural gas distribution pipelines located at a crude oil production facility used for the delivery of commercial quality natural gas and which are not owned or operated by the crude oil production facility.
 - (5) Components that are buried below ground. The portion of well casing that is visible above ground is not considered a buried component.
 - (6) One-half inch and smaller stainless steel tube fittings used to supply compressed air to equipment or instrumentation.
 - (7) One-half inch and smaller stainless steel tube fittings used to supply natural gas to equipment or instrumentation that have been tested using

US EPA Method 21 and reported to be below the minimum allowable leak threshold.

- (8) Components operating under a negative gauge pressure or below atmospheric pressure.
- (9) Components at a crude oil or natural gas production facility that are located downstream from the point of transfer of custody and which are not owned or operated by the production facility.
- (10) Temporary components used for general maintenance and used less than 300 hours per calendar year if the owner or operator maintains, and can make available at the request of the ARB Executive Officer, a record of the date when the components were installed.
- (11) Well casing vents that are open to the atmosphere which are subject to the requirements specified in section 95668(h) of this subarticle.
- ~~(12) Components exclusively handling non-hydrocarbon streams.~~
- ~~(13) Components exclusively handling streams which have methane concentration less than 10 percent by weight (<10 wt%).~~
- (c) Beginning January 1, 2018, all components, including components found on tanks, separators, and pressure vessels not identified in section 95669(b) shall be inspected and repaired within the timeframes specified in this section.
- (d) The ARB Executive Officer may perform inspections at facilities at any time to determine compliance with the requirements specified in this section.
- (e) ~~Except for inaccessible or unsafe to monitor components. Owners or operators shall audio-visually inspect (by hearing and by sight) all operating hatches, pressure-relief valves, well casings, stuffing boxes, and operating pump seals for leaks or indications of leaks at least once every 24 hours for facilities that are visited daily, or~~ at least once per calendar week ~~for unmanned facilities;~~ and,
 - (1) Owners or operators shall audio-visually inspect all pipes for leaks or indications of leaks at least once every 12 months. Inspections performed pursuant to DOGGR requirements satisfy this requirement.
- (f) Any audio-visual inspection specified in 95669(e) that indicates a leak that cannot be repaired within 24 hours shall be tested using Method 21 within 24 hours after initial leak detection, and the leak shall be repaired in accordance with the repair timeframes specified in this section.

See OP-10-73

Formatted: Font: (Intl) Arial

Formatted: Font: (Default) Arial, 12 pt

Formatted: Left, Right: 0", No bullets or numbering, Tab stops: Not at 0.83"

Formatted: Left

See OP-10-70

See OP-10-75

Formatted: Left

- (1) For leaks detected during normal business hours, the leak measurement shall be performed within 24 hours. For leaks detected after normal business hours or on a weekend or holiday, the deadline is shifted to the end of the next normal business day.
- (2) Any leaks measured above the minimum leak threshold shall be successfully repaired within the timeframes specified in this section.

- (g) At least once each calendar ~~quarter~~year, all components shall be tested for leaks of total hydrocarbons in units of parts per million volume (ppmv) calibrated as methane in accordance with EPA Reference Method 21 excluding the use of PID instruments.

(1) The annual inspection frequency will be increased to quarterly if the number of allowable leaks for each leak threshold category specified in Table 1 or 3 is exceeded during an inspection period.

~~(1)(2)~~ The quarterly inspection frequency may be reduced to annually provided that the following conditions are met:

- (A) All components have been measured for five (5) consecutive calendar quarters and the number of leaks has been determined to be below the number of allowable leaks for each leak threshold category specified in Table 1 or 3; and,
- (B) The change in inspection frequency is substantiated by documentation and approved by the ARB Executive Officer.
- (C) The inspection frequency shall revert to quarterly at any time the number of allowable leaks specified in Table 1 or 3 is exceeded during any inspection period.

~~(2)(3)~~ Optical Gas Imaging (OGI) instruments may be used as a leak screening device provided they are approved for use by the local air district and used by a technician with minimum Level II Thermographer or equivalent training; and,

- (A) All leaks detected with the use of an OGI instrument shall be measured using EPA Method 21 within two calendar days of initial OGI leak detection or within 14 calendar days of initial OGI leak detection of an inaccessible or unsafe to monitor component to determine compliance with the leak thresholds and repair timeframes specified in this section.

~~(3)(4)~~ All inaccessible or unsafe to monitor components shall be inspected at least once annually during the next regular process shutdown using Method 21.

- (h) Beginning January 1, 2018 and through December 31, 2019, any component with a leak concentration measured above the following standards shall be repaired within the time period specified:

- (1) Leaks with measured total hydrocarbons greater than or equal to 10,000 ppmv but not greater than 49,999 ppmv shall be successfully repaired or removed from service within 14 calendar days of initial leak detection.

See OP-10-76

Formatted: Font: (Intl) Arial

Formatted: Indent: Left: 0.82", No bullets or numbering

See OP-10-77

- (2) Leaks with measured total hydrocarbons greater than or equal to 50,000 ppmv shall be successfully repaired or removed from service within five (5) calendar days of initial leak detection.

- (3) Critical components shall be successfully repaired by the end of the next process shutdown or within 12 months from the date of initial leak detection, whichever is sooner.

**Table 1 - Allowable Number of Leaks
January 1, 2018 through December 31, 2019**

Leak Threshold	200 or Less Components	More than 200 Components
10,000-49,999 ppmv	5	2% of total inspected
50,000 ppmv or greater	32	1% of total inspected

See OP-10-80

**Table 2 - Repair Time Periods
January 1, 2018 through December 31, 2019**

Leak Threshold	Repair Time Period
10,000-49,999 ppmv	14 calendar days
50,000 ppmv or greater	5 calendar days
Critical Components	Next shutdown or within 180 calendar days <u>12 months</u>

See OP-10-87

Formatted Table

- (i) On or after January 1, 2020, any component with a leak concentration measured above the following standards shall be repaired within the time period specified:
- (1) Leaks with measured total hydrocarbons greater than or equal to 1,000 ppmv but not greater than 9,999 ppmv shall be successfully repaired or removed from service within 14 calendar days of initial leak detection.
 - (2) Leaks with measured total hydrocarbons greater than or equal to 10,000 ppmv but not greater than 49,999 ppmv shall be successfully repaired or removed from service within five (5) calendar days of initial leak detection.
 - (3) Leaks with measured total hydrocarbons greater than or equal to 50,000 ppmv shall be successfully repaired or removed from service within two (2) calendar days of initial leak detection.
 - (4) Critical components shall be successfully repaired by the end of the next process shutdown or within 12 months from the date of initial leak detection, whichever is sooner.

**Table 3 - Allowable Number of Leaks
On or After January 1, 2020**

Leak Threshold	200 or Less Components	More than 200 Components
1,000-9,999 ppmv	5	2% of total inspected
10,000-49,999 ppmv	32	1% of total inspected
50,000 ppmv or greater	20	<u>0.5% of total inspected</u>

See OP-10-80

**Table 4 - Repair Time Periods
On or After January 1, 2020**

Leak Threshold	Repair Time Period
1,000-9,999 ppmv	14 calendar days
10,000-49,999 ppmv	5 calendar days
50,000 ppmv or greater	2 calendar days
Critical Components	Next shutdown or within 180 calendar days <u>12 months</u>

See OP-10-87

Formatted Table

- (j) Upon detection of a component with a leak concentration measured above the standards specified, the owner or operator shall affix to that component a weatherproof readily visible tag that identifies the date and time of leak detection measurement and the measured leak concentration. The tag shall remain affixed to the component until all of the following conditions are met:
- (1) The leaking component has been successfully repaired or replaced; and,
 - (2) The component has been re-inspected and measured below the lowest standard specified for the inspection year when measured in accordance with EPA Reference Method 21, excluding the use of PID instruments.
 - (3) Tags shall be removed from components following successful repair.
- (k) Owners or operators shall maintain, and make available upon request by the ARB Executive Officer, a record of all leaks found at the facility as specified in Appendix A, Tables A4 and A5, and shall report the results to ARB once per calendar year as specified in section 95671 of this subarticle.

Additional Requirements

- (l) Hatches shall remain closed at all times except during sampling, adding process material, or attended maintenance operations.

- (m) Open-ended lines and valves located at the end of lines shall be sealed with a blind flange, plug, cap or a second closed valve, at all times except during operations requiring liquid or gaseous process fluid flow through the open-ended line. Open-ended lines do not include vent stacks used to vent natural gas from equipment and cannot be sealed for safety reasons. Any non-leaking open-ended line shall be repaired within 15 days while any leaking open-ended line shall be repaired in accordance with 95669(h) and 95669(i).
- (n) Components or component parts which incur five (5) repair actions within a continuous 12-month period shall be replaced with a compliant component in working order and must be re-measured using Method 21 to determine that the component is below the minimum leak threshold. A record of the replacement must be maintained in a log at the facility, and shall be made available upon request by the ARB Executive Officer.
- (o) Compliance with Leak Detection and Repair Requirements:
- (1) The failure of an owner or operator to meet any of the requirements specified shall constitute a violation of this subarticle.
 - (2) Between January 1, 2018 and December 31, 2019, no facility shall exceed the number of allowable leaks specified in Table 1 during any inspection period as determined by the ARB Executive Officer or by the facility owner or operator in accordance with Method 21, excluding the use of PID instruments.
 - (3) On or after January 1, 2020, no facility shall exceed the number of allowable leaks specified in Table 3 during any inspection period as determined by the ARB Executive Officer or by the facility owner or operator in accordance with Method 21, excluding the use of PID instruments.
 - ~~(4) On or after January 1, 2020, no component shall exceed a leak of total hydrocarbons greater than or equal to 50,000 ppmv as determined by the ARB Executive Officer or by the facility owner or operator in accordance with Method 21, excluding the use of PID instruments.~~

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code.
Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95670. Critical Components.

- (a) By January 1, 2018 or within 180 days from installation, critical components used in conjunction with a critical process unit at facilities listed in section 95666 must be pre-approved by the ARB Executive Officer if identified by owners or operators who wish to claim any critical component exemptions available under this subarticle.
- (b) Owners or operators must provide sufficient documentation demonstrating that a

Formatted: Left

See OP-10-88

OP-10-135

OP-10-136

critical component is required as part of a critical process unit and that shutting down

the critical component would result in emissions greater than the emissions measured from the component, or would impact safety or reliability of the natural gas system.

- (c) A ~~request for list of~~ critical components ~~s approval is made by submitting a record of the component must be submitted~~ as specified in Appendix A, Table A3 along with supporting documentation to the ARB at the address listed in section 95672(b).
- (d) Owners or operators shall maintain, and make available upon request by the ARB Executive Officer, a record of all critical components located at the facility as specified in Appendix A, Table A3.
- (e) Each critical component must be identified using a weatherproof, readily visible tag that indicates it as an ARB approved critical component and includes the date of ARB Executive Officer approval.

See OP-10-84

- ~~(f) Approval of a critical component may be granted only if owners or operators fully comply with this section. The ARB Executive Officer retains discretion to deny any request for critical component approval.~~

OP-10-137

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code.
Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code

§ 95671. Record Keeping Requirements.

- (a) Beginning January 1, 2018, owners or operators of facilities listed in section 95666 subject to requirements specified in sections 95668 and 95669 shall maintain, and make available upon request by ARB a copy of the following records:

Flash Analysis Testing

- (1) Maintain, for at five years from the date of each flash analysis test, a record of the flash analysis testing that shall include the following:
 - (A) A sketch or diagram of each separator and tank system tested that identifies the liquid sampling location and all pressure vessels, separators tanks, sumps, and ponds within the system; and,
 - (B) A record of the flash analysis testing results, calculations, and a description of the separator and tank system as specified in Appendix A Table A1; and,
 - (C) A field testing form for each flash analysis test conducted as specified in Appendix C Form 1; and,
 - (D) The laboratory report(s) for each flash analysis test conducted.

Reciprocating Natural Gas Compressors

- (2) Maintain, for at least five years from the date of each leak concentration measurement, a record of each rod packing leak concentration measurement found above the minimum leak threshold as specified in Appendix A, Table A5.
- (3) Maintain, for at least five years from the date of each emissions flow rate measurement, a record of each rod packing emission flow rate measurement as specified in Appendix A, Table A7.

Centrifugal Natural Gas Compressors

- (4) Maintain, for at least five years from the date of each emissions flow rate measurement, a record of each wet seal emission flow rate measurement as specified in Appendix A, Table A7.

Natural Gas Powered Pneumatic Devices

- (5) Maintain, for at least five years from the date of each emissions flow rate measurement, a record of the emission flow rate measurement as specified in Appendix A, Table A7.

Liquids Unloading of Natural Gas Wells

- (6) Maintain, for at least five years from the date of each liquids unloading measurement or calculation, a record of the measured or calculated volume of natural gas vented to perform liquids unloading and equipment installed in the natural gas well(s) designed to automatically perform liquids unloading (e.g., foaming agent, velocity tubing, plunger lift, etc.) as specified in Appendix A Table A2.

Well Casing Vents

- (7) Maintain, for at least five years from the date of each emissions flow rate measurement, a record of each well casing vent emission flow rate measurement as specified in Appendix A, Table A7.

Underground Natural Gas Storage

- (8) Maintain, for at least five years from the date of each leak concentration measurement, a record of the initial and final leak concentration measurement for leaks identified during daily inspections or identified by a continuous leak monitoring system and measured above the minimum allowable leak threshold as specified in Appendix A Table A5

Leak Detection and Repair

- (9) Maintain, for at least five years from each inspection, a record of each leak detection and repair inspection as specified in Appendix A Table A4.
- (10) Maintain, for at least five years from the date of each inspection, a component leak concentration and repair form for each inspection as specified in Appendix A Table A5.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601, 39607 and 41511, Health and Safety Code. Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95672. Reporting Requirements.

(a) Beginning January 1, 2018, owners or operators of facilities listed in section 95666 subject to requirements specified in sections 95668 and 95669 shall report the following information to ARB within the following timeframes specified:

(1) All annual reports described below for a calendar year must be submitted by June 30 of the following year.

(2) All quarterly reports described below must be submitted within 60 days from the end of a quarter.

(a)(3) All other reports must be submitted as specified below:

See OP-10-89

Formatted: Font: (Intl) Arial

Formatted

Formatted: Font: (Intl) Arial

Formatted: Font: (Intl) Arial

Formatted: Font: (Default) Arial, 12 pt

Flash Analysis Testing

- (4)(4) Within 90 days of performing flash analysis testing or recalculating annual methane emissions, report the test results, calculations, and a description of the separator and tank system as specified in Appendix A, Table A1.

Reciprocating Natural Gas Compressors

- (2)(5) Annually, report the leak concentration for each rod packing or seal measured above the minimum leak threshold as specified in Appendix A, Table A5.

- (3)(6) Annually, report the emission flow rate measurement for each rod packing or seal as specified in Appendix A, Table A7.

Centrifugal Natural Gas Compressors

- (4)(7) Annually, report the emission flow rate measurement for each wet seal as specified in Appendix A, Table A7.

Natural Gas Powered Pneumatic Devices

- (5)(8) Annually, report the emission flow rate measurement for each

pneumatic device with a designed emission flow rate of less 6 scfh as specified in Appendix A, Table A7.

Liquids Unloading of Natural Gas Wells

| ~~(6)(9)~~ Annually, report the measured or calculated volume of natural gas vented to perform liquids unloading and equipment installed in the natural gas well(s)

designed to automatically perform liquids unloading as specified in Appendix A Table A3.

Well Casing Vents

| ~~(7)~~(10) Annually, report the emission flow rate measurement for each well casing vent that is open to atmosphere as specified in Appendix A, Table A7.

Underground Natural Gas Storage

| ~~(8)~~(11) Within 24 hours of identify a leak that is measured above the maximum leak threshold specified in section 95669 during leak inspections conducted at each natural gas injection/withdrawal wellhead assembly, attached pipelines, and the surrounding area within a 200 foot radius of the wellhead, the owner or operator shall notify the ARB, the Department of Oil, Gas, and Geothermal Resources, and the local air district to report the leak concentration measurement.

| ~~(9)~~(12) Within 24 hours of receiving an alarm signaled by an air monitoring system that detects levels of natural gas that exceed more than 10 percent of baseline conditions, the owner or operator shall notify the ARB, the Department of Oil, Gas, and Geothermal Resources, and the local air district to report the emissions measurement.

| ~~(10)~~(13) Quarterly, report the initial and final leak concentration measurement for leaks identified during daily inspections or identified by a continuous leak monitoring system and measured above the minimum allowable leak threshold as specified in Appendix A Table A5.

Leak Detection and Repair

| ~~(11)~~(14) Annually, report the results of each leak detection and repair inspection conducted during the calendar year as specified in Appendix A, Table A4.

| ~~(12)~~(15) Annually, report the initial and final leak concentration measurements for components measured above the minimum allowable leak threshold as specified in Appendix A Table A5.

(b) Reports may be e-mailed electronically to ARB with the subject line "O&G GHG Regulation Reporting" to oil&gas@arb.ca.gov or mailed to:

California Air Resources Board
Attention: O&G GHG Regulation Reporting
Industrial Strategies Division
1001 I Street
Sacramento, California 95814

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601, 39607 and 41511, Health and Safety Code. Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95673. Implementation.

(a) *Implementation by ARB and by the Local Air Districts*

- (1) The requirements of this subarticle are provisions of state law and are enforceable by both ARB and the local air districts where equipment covered by this subarticle is located. Local air districts may incorporate the terms of this subarticle into local air district rules. An owner or operator of equipment subject to this subarticle must pay any fees assessed by a local air district for the purposes of recovering the district's cost of implementing and enforcing the requirements of this subarticle. Any penalties secured by a local air district as the result of an enforcement action that it undertakes to enforce the provisions of this subarticle may be retained by the local air district.
- (2) The ARB Executive Officer, at his or her discretion, may enter into an agreement or agreements with any local air district to further define funding, implementation and enforcement processes, including arrangements further specifying approaches for implementation and enforcement of this subarticle, and for information sharing between ARB and local air districts relating to this subarticle.
- (3) Implementation and enforcement of the requirements of this subarticle by a local air district may in no instance result in a standard, requirement, or prohibition less stringent than provided for by this subarticle, as determined by the Executive Officer. The terms of any local air district permit or rule relating to this subarticle do not alter the terms of this subarticle, ~~which remain as separate requirements for all sources subject to this subarticle.~~
- (4) ~~Implementation and enforcement of the requirements of this subarticle by a local air district, including inclusion or exclusion of any of its terms within any local air district permit, or within a local air district rule, or registration of a facility with a local air district or ARB, does not in any way waive or limit ARB's authority to implement and enforce upon the requirements of this subarticle.~~ A facility's permitting or registration status also in no way limits the ability of a local air district to enforce the requirements of this subarticle.

See OP-10-93

(b) *Requirements for Regulated Facilities*

- (1) Local Air District Permitting Application Requirements
 - (A) Owners or operators of facilities or equipment regulated by this subarticle, and who are required by federal, state, or local law to hold local air district permits that cover those facilities or equipment shall apply for local air district permit terms ensuring compliance with this article. This

requirement applies to facilities or equipment upon issuance of any new local air district permit covering these facilities or equipment, or upon the scheduled renewal of an existing permit covering these facilities or equipment.

- (B) If, after the effective date of this subarticle, any local air district amends or adopts permitting rules that result in additional equipment or facilities regulated by this subarticle becoming subject to local air district permitting requirements, then owners or operators of that equipment or facility must apply for terms in any applicable local air district permits for that equipment or facility that ensure compliance with this subarticle.

(2) Registration Requirements

- (A) Owners or operators of facilities or equipment that is regulated by this subarticle shall register the equipment at each facility by reporting the following information to ARB as specified in Appendix A Table A6 no later than January 1, 2018, unless the local air district has established a registration or permitting program that collects at least the following information, and has entered into an MOU with ARB specifying how information is to be shared with ARB.

1. The owner or operator's name and contact information.
2. The address or location of each facility with equipment regulated by this subarticle.
3. A description of all equipment covered by this subarticle located at each facility including the following:
 - a The number of crude oil or natural gas wells at the facility.
 - b A list identifying all ~~separator and tank systems pressure-vessels, tanks, separators, sumps, and ponds~~ at the facility, including the size of each tank and separator in units of barrels comprising the separator and tank system.
 - c The annual crude oil, natural gas, and produced water throughput of the facility.
 - d A list identifying all reciprocating and centrifugal natural gas compressors at the facility,
 - e A count of all natural gas powered pneumatic devices and pumps at the facility.
4. The permit numbers of all local air district permits issued for the facility or equipment, and an identification of permit terms that ensure compliance with the terms of this subarticle, or an explanation of why such terms are not included.

See OP-10-94

5. An attestation that all information provided in the registration is provided by a party authorized by the owner or operator to do so, and that the information is true and correct.

(B) Updates to these reports, recording any changes in this information, must be filed with ARB, or, as relevant, with the local air district no later than January 1 of the calendar year after the year in which any information required by this subarticle has changed. .

(3) Owners or operators of equipment subject to this subarticle must comply with all the requirements of sections 95666, 95667, 95668, 95669, 95670, 95671, 95672, and 95673 of this subarticle, regardless of whether or not they have complied with the permitting and registration requirements of this section.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601, 39603, 39607 and 41511, Health and Safety Code. Reference: Sections 38551, 38560, 39600, 40701, 40702, 41511, 42300, 42301 and 42311, Health and Safety Code.

§ 95674. Enforcement.

- (a) Failure to comply with the requirements of this subarticle at any individual piece of equipment subject to this subarticle constitutes a single, separate, violation of this subarticle.
- (b) Each day, or portion thereof, that an owner or operator is not in full compliance with the requirements of this subarticle is a single, separate, violation of this subarticle.
- (c) Each metric ton of methane emitted in violation of this subarticle constitutes a single, separate, violation of this subarticle.
- (d) Failure to submit any report required by this subarticle shall constitute a single, separate violation of this subarticle for each day or portion thereof that the report has not been received after the date the report is due.
- (e) Failure to retain and failure to produce any record that this subarticle requires to be retained or produced shall each constitute a single, separate violation of this subarticle for each day or portion thereof that the record has not been retained or produced.
- (f) Submitting or producing inaccurate information required by this subarticle shall be a violation of this subarticle.
- (g) Falsifying any information or record required to be submitted or retained by this subarticle, ~~or submitting or producing inaccurate information,~~ shall be a violation of this subarticle.

OP-10-138

Comment [YS9]: Already included in Section (f) above.

NOTE: Authority cited: Sections 38510, 38562, 38580, 39600, 39601, 39607 and 41511, Health and Safety Code. Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95675. No Preemption of More Stringent Air District or Federal Requirements.

This regulation does not preempt any more stringent requirements imposed by any Air District. Compliance with this subarticle does not excuse noncompliance with any Federal regulation. The ARB Executive Officer retains authority to determine whether an Air District requirement is more stringent than any requirement of this subarticle.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code. Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

§ 95676. Severability.

Each part of this subarticle is deemed severable, and in the event that any part of this subarticle is held to be invalid, the remainder of the subarticle shall continue in full force and effect.

NOTE: Authority cited: Sections 38510, 38562, 39600, 39601 and 41511, Health and Safety Code. Reference: Sections 38551, 38560, 39600 and 41511, Health and Safety Code.

Appendix A

Record Keeping and Reporting Forms

Table A1
Flash Analysis Testing Record Keeping and Reporting Form

Tank System ID:						
Testing Date:						
Facility Name:				Air District:		
Owner/Operator Name:				Signature*:		
Address:						
City:			State:		Zip:	
Contact Person:			Phone Number:			
Crude Oil or Condensate Flash Test and Calculation Results						
API Gravity	GOR (scf/bbl)	Molecular Weight	WT% CH ₄	Sample Temp (°F)	Throughput (bbl/day)	Metric Tons CH ₄ /Yr
Produced Water Flash Test and Calculation Results						
GWR (scf/bbl)	Molecular Weight	WT% CH ₄	Sample Temp (°F)	Throughput (bbl/day)	Metric Tons CH ₄ /Yr	
Days in Operation per Year:						
Combined Annual Methane Emission Rate:					MTCH ₄ /Yr	
Separator and Tank System Description						
Total Number in Separator and Tank System				Total Number on Vapor Collection		
Wells:						
Pressure Vessels:						
Pressure Separators:						
Separators:						
Tanks:						
Sumps:						
Ponds:						

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

Table A2
Liquids Unloading Record Keeping and Reporting Form

		Facility Name:		Air District:	
		Owner/Operator Name:		Signature*:	
		Address:			
City:				State:	Zip:
Contact Person:				Phone Number:	
Date	Well ID	Volume of Natural Gas Vented (Mcf)	Calculation Method or Measured	Automation Equipment**	

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

**Automation equipment includes foaming agent, velocity tubing, plunger lift, etc.

Table A3
Designated Critical Component Form

Facility Name:		Air District:	
Owner/Operator Name:		Signature*:	
Address:			
City:		State:	Zip:
Contact Person:		Phone Number:	
Component Type:			Approval Date:

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

Table A4
Leak Detection and Repair Inspection
Record Keeping and Reporting Form

Inspection Date:		
Facility Name:		Air District:
Owner/Operator Name:	Signature*:	
Address:		
City:	State:	Zip:
Contact Person:	Phone Number:	
Inspection Company Name:		
Number of Leaks per Leak Threshold Category	Percentage of Total Components Inspected	
1,000 to 9,999 ppmv:		
10,000 to 49,999 ppmv:		
50,000 ppmv or Greater:		
Total Components Inspected:		

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

[illegible]

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

Table A6
Reporting and Registration Form for Facilities

[illegible]

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

Table A7
Emission Flow Rate Record Keeping and Reporting Form

Facility Name:		Air District:	
Facility Address or Location:			
Owner/Operator Name:		Signature*:	
Address:			
City:		State:	Zip:
Contact Person:		Phone Number:	
Type of Equipment or Well ID	Measurement Date	Flow Rate (scfm or scfh)	

*By signing this form, I am attesting that I am authorized to do so, and that the information provided is true and correct.

Appendix B

Calculation for Determining Vented Natural Gas Volume from Liquids Unloading of Natural Gas Wells

$$E_{scf} = \left(\frac{V * P_1 * T_2}{P_2 * T_1} \right) + (FR * HR)$$

Where:

E_{scf} is the natural gas emissions per event in scf

$V = \pi * r^2 * D$ (volume of the well)

$r = \frac{CD}{2}$ (radius of the well)

CD is the casing diameter in feet

D is the depth of the well in feet

P_1 is the shut-in pressure of the well in psia

P_2 is 14.7 psia (standard surface pressure)

T_1 is the temperature of the well at shut-in pressure in °F

T_2 is 60 °F (standard surface temperature)

FR is the metered flowrate of the well or the sales flowrate of the well in scf/hour

HR is the hours the well was left open to atmosphere during unloading

$$CH_4 \text{ emissions} = E_{scf} * MF_{CH_4} * MV * MW_{CH_4} * \left(\frac{\text{metric ton}}{2204.6 \text{ lb}} \right)$$

Where:

$CH_4 \text{ emissions}$ is in metric tons per event

$MF_{CH_4} = \frac{\text{lbmole } CH_4}{\text{lbmole gas}}$ (mole fraction of CH_4 in the natural gas)

$MV = \frac{1 \text{ lbmole gas}}{379.3 \text{ scf gas}}$ (molar volume)

$MW_{CH_4} = \frac{16 \text{ lb } CH_4}{\text{lbmole } CH_4}$ (molecular weight of CH_4)

Appendix C

Test Procedure for Determining Annual Flash Emission Rate of Methane from Crude Oil, Condensate, and Produced Water

1. PURPOSE AND APPLICABILITY

In crude oil and natural gas production, flash emissions may occur when gas entrained in crude oil, condensate, or produced water is released from the liquids due to a decrease in pressure or increase in temperature, such as when the liquids are transferred from an underground reservoir to the earth's surface. This procedure is used for determining the annual flash emission rate from tanks used to separate, store, or hold crude oil, condensate or produced water. The laboratory methods required to conduct this procedure are used to measure methane and other gaseous compounds.

2. PRINCIPLE AND SUMMARY OF TEST PROCEDURE

This procedure is conducted by collecting one sample of crude oil or condensate and one sample of produced water upstream of a separator or tank where flashing may occur. Samples shall be collected under pressure and according to the methods specified in this procedure. If a pressure separator is not available for collecting samples, sampling shall be conducted using a portable pressurized separator.

Two sampling methods are specified for collecting liquid samples while maintaining a positive pressure within a sampling cylinder to prevent flashing within the cylinder. The first method requires a double valve cylinder for collecting crude oil or produced water samples. The second method requires a cylinder equipped with a pressurized piston for collecting condensate or produced water samples. Both methods shall be conducted as specified in this procedure.

The laboratory methods specified for this procedure are based on American Standards and Testing Materials (ASTM), US Environmental Protection Agency (EPA), and Gas Processor Association (GPA) methods. These laboratory methods measure the volume and composition of gases that flash from the liquids, including a Gas-Oil or Gas-Water Ratio, as well as the molecular weight and weight percent of the gaseous compounds. The laboratory results are used with the crude oil or condensate or produced water throughput to calculate the mass of emissions that are flashed from the liquids per year.

3. DEFINITIONS

For the purposes of this procedure, the following definitions apply:

- 3.1** "Air Resources Board or ARB" means the California Air Resources Board.
- 3.2** "API Gravity" means a scale used to reflect the specific gravity (SG) of a fluid such as crude oil, condensate, produced water, or natural gas. The API gravity is calculated as $[(141.5/SG) - 131.5]$, where SG is the specific gravity of the fluid at 60°F, and where API refers to the American Petroleum Institute.
- 3.3** "Condensate" means hydrocarbon and other liquid either produced or separated from crude oil or natural gas during production and which condenses due to changes in pressure or temperature.
- 3.4** "Crude oil" means any of the naturally occurring liquids and semi-solids found in rock formations composed of complex mixtures of hydrocarbons ranging from one to hundreds of carbon atoms in straight and branched chain rings.
- 3.5** "Double valve cylinder" means a metal cylinder equipped with valves on either side for collecting crude oil or produced water samples.
- 3.6** "Emissions" means the discharge of natural gas into the atmosphere.
- 3.7** "Emulsion" means any mixture of crude oil, condensate, or produced water with varying amounts of natural gas contained in the liquid.
- 3.8** "Flash or flashing" means a process during which gas entrained in crude oil, condensate, or produced water under pressure is released when subject to a decrease in pressure, such as when liquids are transferred from an underground reservoir to a tank on the earth's surface.
- 3.9** "Gas-Oil Ratio (GOR)" means a measurement used to describe the volume of gas that is flashed from a barrel of crude oil or condensate.
- 3.10** "Gas-Water Ratio (GWR)" means a measurement used to describe the volume of gas that is flashed from a barrel of produced water.
- 3.11** "Natural gas" means a naturally occurring mixture or process derivative of hydrocarbon and non-hydrocarbon gases, of which its constituents include methane, carbon dioxide, and heavier hydrocarbons. Natural gas may be field quality (which varies widely) or pipeline quality.
- 3.12** "Operating pressure" means the steady-state pressure of the vessel from which a sample is collected. If no pressure gauge is available or the sampling train pressure gauge reading is greater than +/- 5 psig of the vessel pressure, the sampling train pressure gauge reading shall be used to record the steady state pressure on Form 1.

- 3.13** "Operating temperature" means the steady-state temperature of the vessel from which a sample is collected. If no temperature gauge is available or the sampling train temperature gauge reading is greater than +/- 4°F of the vessel temperature, the sampling train temperature gauge reading shall be used to record the steady state temperature on Form 1.
- 3.14** "Percent water cut" means the volume percentage of produced water to crude oil or condensate.
- 3.15** "Piston cylinder" means a metal cylinder containing an internal pressurized piston for collecting condensate or produced water samples.
- 3.16** "Portable pressurized separator" means a sealed vessel that can be moved from one location to another by attachment to a motor vehicle without having to be dismantled and is used for separating and sampling crude oil, condensate, or produced water at the steady-state temperature and pressure of the separator and tank system required for sampling.
- 3.17** "Pressure separator" means a pressure vessel used for the primary purpose of separating crude oil and produced water or for separating natural gas and produced water.
- 3.18** "Pressure vessel" means any vessel rated, as indicated by an ASME pressure rating stamp, and operated to contain normal working pressures of at least 15 psig without vapor loss to the atmosphere and may be used for the separation of crude oil, condensate, produced water, or natural gas.
- 3.19** "Produced water" means water recovered from an underground reservoir as a result of crude oil, condensate, or natural gas production and which may be recycled, disposed, or re-injected into an underground reservoir.
- 3.20** "Separator" means any tank or pressure separator used for the primary purpose of separating crude oil and produced water or for separating natural gas, condensate, and produced water. In crude oil production a separator may be referred to as a Wash Tank or as a three-phase separator. In natural gas production a separator may be referred to as a heater/separator.
- 3.21** "Separator and tank system" means the first separator in a crude oil or natural gas production system and any tank or sump connected directly to the first separator.
- 3.22** "Tank" means any container constructed primarily of non-earthen materials used for the purpose of storing, holding, or separating emulsion, crude oil, condensate, or produced water and that is designed to operate below 15 psig normal operating pressure.

- 3.23** “Throughput” means the average volume of crude oil, condensate, or produced water expressed in units of barrels per day.

4. BIASES AND INTERFERENCES

- 4.1** The sampling method used to collect a liquid sample will have an impact on the final results reported. Liquid samples shall be collected in accordance with the sampling procedures specified in this procedure.
- 4.2** The location from where a sample is collected will have an impact on the final results reported. Liquid samples shall be collected from a pressure separator or portable pressurized separator as specified in this procedure.
- 4.3** Collecting liquid samples from a pressure separator or portable pressurized separator that periodically drains liquids will have an impact on the final results reported. Samples shall not be collected from a pressure separator or portable pressurized separator while it periodically drains liquids.
- 4.4** Collecting liquid samples using an empty double valve cylinder without displacing an immiscible liquid from the cylinder will allow gases to flash from the cylinder and will have an impact on the final results reported. Samples collected using a double valve cylinder shall be collected as specified in this procedure.
- 4.5** Displacing liquids from a double valve cylinder that are reactive and not immiscible with the sample liquid collected will result in gas composition or volume errors and will affect the final results reported. Displacement liquids shall be pre-tested by a laboratory to verify that the liquid is non-reactive and is immiscible with the sample liquid collected.
- 4.6** Non-calibrated equipment including pressure or temperature gauges will have an impact the final results reported. All pressure and temperature measurements shall be conducted with calibrated gauges as specified in this procedure.
- 4.7** Conducting laboratory procedures other than those specified in this procedure will have an impact on the final results reported. All laboratory methods and quality control and quality assurance procedures shall be conducted as specified in this procedure.
- 4.8** The collection and testing of duplicate samples is recommended in order to verify the reported results.

5. SAMPLING EQUIPMENT SPECIFICATIONS

- 5.1** A pressure gauge capable of measuring liquid pressures of less than 50 pound per square inch gauge pressure within +/-10% accuracy.
- 5.2** A pressure gauge capable of measuring liquid pressures greater than 50 pounds per square inch gauge pressure within +/- 5% accuracy.
- 5.3** A temperature gauge capable of reading liquid temperature within +/- 2°F and within a range of 32°F to 250°F.
- 5.4** A graduated cylinder capable of measuring liquid in at least five (5) milliliter increments with at least the same capacity as the double valve cylinder used for liquid sampling.
- 5.5** A portable pressurized separator that is sealed from the atmosphere and is used for collecting crude oil, condensate, and produced water samples at the steady state temperature and pressure of the separator and tank system being sampled.

6. SAMPLING EQUIPMENT

- 6.1** A double valve cylinder or a piston cylinder of at least 300 milliliters in volume for collecting crude oil or condensate samples or at least 800 milliliters in volume for collecting produced water samples.
- 6.2** A graduated cylinder for use with double valve cylinder.
- 6.3** A waste container suitable for capturing and disposing sample liquid.
- 6.4** High-pressure rated metal components and control valves that can withstand the temperature and pressure of the pressure vessel or portable pressurized separator being sampled.
- 6.5** Pressure gauges with minimum specifications listed in section 5.
- 6.6** A temperature gauge with minimum specifications listed in section 5.
- 6.7** If required, a portable pressurized separator with minimum specifications listed in section 5.

7. DATA REQUIREMENTS

- 7.1** The data requirements required to conduct this procedure shall be provided by the facility owner or operator prior to conducting the sampling methods specified in this procedure. Field sampling shall not be performed until all

data requirements are provided as listed in section 7.2 and as specified on Form 1.

7.2 For each pressure separator or portable pressurized separator sampled, the following data shall be recorded on the sample cylinder identification tag and on Form 1 prior to conducting a sample collection method:

- (a) The separator identification number or description.
- (b) The separator temperature and pressure if available.
- (c) Crude oil or condensate throughput.
- (d) Produced water throughput.
- (e) Percent water cut.
- (f) Gas flow rate of three phase separator if available.
- (g) Number of wells in the separator and tank system.
- (h) Days of operation per year.

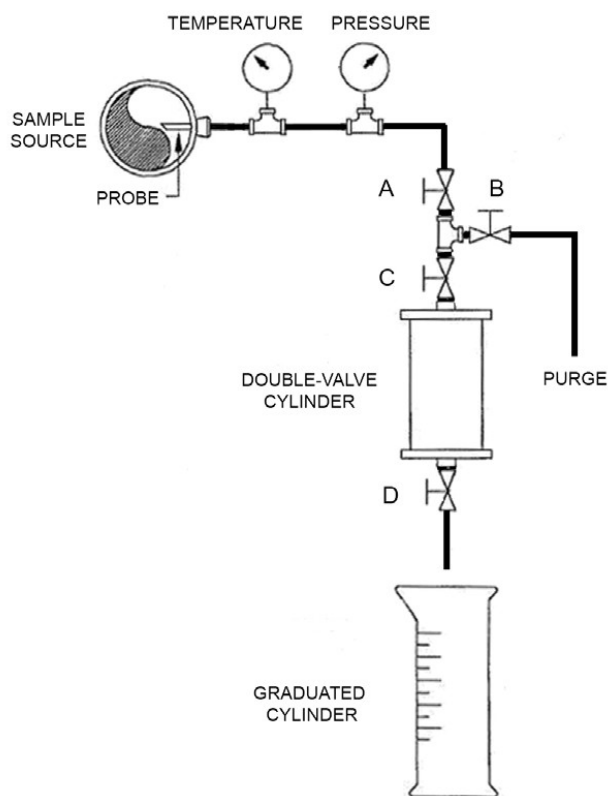
8. DOUBLE VALVE CYLINDER SAMPLING METHOD

- 8.1** The double valve cylinder sampling method is used for collecting crude oil or produced water samples and is not applicable for collecting samples of condensate. Liquid samples of condensate shall be collected using the piston cylinder sampling method specified in section 9.
- 8.2** Fill the double valve cylinder with non-reactive liquid that is immiscible with the liquid to be collected to prevent flashing within the cylinder and to prevent the displacement liquid from mixing or attaining homogeneity with the sample liquid.
- 8.3** Locate a pressure separator immediately upstream of the separator or tank required for testing and verify it is pressurized to at least 15 psig. Install a portable pressurized separator if no pressure separator is available immediately upstream of the separator or tank that can be used to collect crude oil and produced water samples.
- 8.4** Record the sample collection data requirements specified in section 7 on the cylinder identification tag and on Form 1.
- 8.5** Locate the sampling port(s) for collecting liquid samples.
- 8.6** Connect the sampling train as illustrated in Figure 1 to the sampling port on the pressure separator or portable pressurized separator while minimizing tubing between the purge valve and cylinder as shown. Bushings or reducers may be required.
- 8.7** Purge the sampling train: Place the outlet of valve B into the waste container. With valves B, C and D closed, slowly open valve A completely,

and then slowly open valve B to purge the sample train until a steady stream of liquid without gas pockets is observed, and then close valve B.

- 8.8** Prepare for sampling: Orient the double-valve cylinder in the vertical position so that displacement liquid can readily be discharged from the cylinder. Note that the orientation of valves C and D depend on the type of sample being collected and the liquid used for displacement. Based on density differences in liquids, the heaviest liquid must be introduced or expelled from the bottom of cylinder. See Figure 2
- 8.9** Slowly open valve C to the full open position and place the outlet of valve D into the graduated cylinder.

Figure 1: Double Valve Cylinder Sampling Train

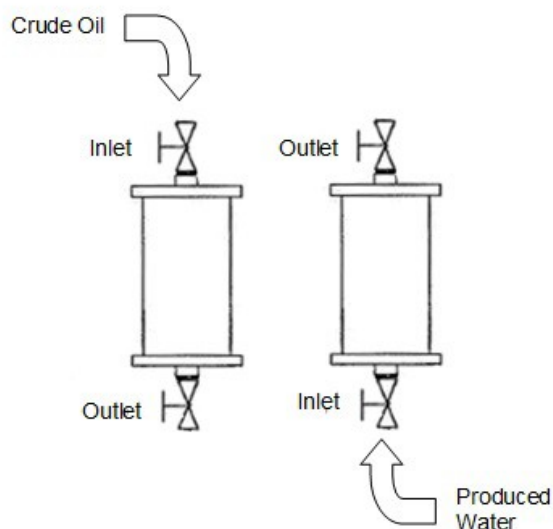


- 8.10** Collect liquid sample: Slowly open valve D to allow a slow displacement of the non-reactive displacement liquid at a rate between 150 and 200 milliliters per minute (3 drips per second) to prevent the sample liquid from flashing

inside the cylinder. Continue until 80 to 95 percent of the displacement liquid is measured in the graduated cylinder, and then close valves D and C.

- 8.11** Record the steady state pressure and temperature on Form 1.

Figure 2: Double Valve Cylinder Orientation

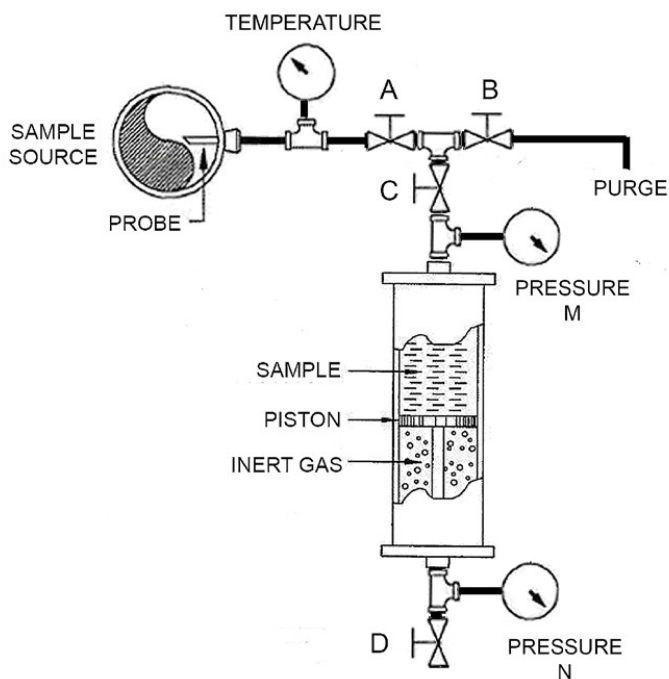


- 8.12** Record the double valve cylinder volume and the volume of liquid sampled on the cylinder identification tag and on Form 1.
- 8.13** Disconnect the sample cylinder from the sampling train and verify that both valves are sealed.
- 8.14** Remove sampling train: With valves D and C closed, purge any remaining liquid in the sampling train through valve B. Then close valves A and B. Disconnect the sampling train from the pressure separator or portable pressurized separator.
- 8.15** Verify that all of the data requirements are recorded on the cylinder identification tag and on Form 1.
- 8.16** Transport the cylinder to the laboratory for conducting the laboratory methods specified in section 12.

9. PISTON CYLINDER SAMPLING METHOD

- 9.1** Locate a pressure separator immediately upstream of the separator or tank required for testing and verify it is pressurized to at least 15 psig. Install a portable pressurized separator if no pressure separator is available immediately upstream of the separator or tank that can be used to collect condensate and produced water samples.
- 9.2** Record the sample collection data requirements specified in section 7 on the cylinder identification tag and on Form 1.
- 9.3** Locate the sampling port(s) for collecting liquid samples.
- 9.4** Connect the sampling train as illustrated in Figure 3 to the pressure separator or pressurized portable separator while minimizing tubing between the purge valve and cylinder as shown. Bushings or reducers may be required.
- 9.5** Purge the sampling train: Place the outlet of valve B into the waste container. With valves B, C and D closed, slowly open valve A completely, and then slowly open valve B to purge the sample train until a steady stream of liquid without gas pockets is observed, and then close valve B.

Figure 3: Piston Cylinder Sampling Train



- 9.6 Prepare for sampling: With valve B closed and valve A open, slowly open valve C to the full open position, then slowly open valve D until the pressure indicated on Gauge N is equal to Gauge M.
- 9.7 Collect liquid sample: Slowly open Valve D to allow liquid to enter the piston cylinder at a rate of 150 to 200 milliliters per minute until 80 to 95 percent of the cylinder is filled with liquid. Then close valves C and D.
- 9.8 Record the steady state pressure and temperature on Form 1.
- 9.9 Record the cylinder volume and volume of liquid sampled on the cylinder identification tag and on Form 1.
- 9.10 Disconnect the sample cylinder from the sampling train and verify that both valves are sealed.
- 9.11 Remove sampling train: Place the outlet of valve B into the waste container and slowly open valve B to purge all liquid from the sampling train. Then

close valves A and B. Disconnect the sampling train from the pressure separator or portable pressurized separator.

9.12 Verify that all of the data requirements are recorded on the cylinder identification tag and on Form 1.

9.13 Transport the cylinder to the laboratory for conducting the laboratory methods as specified in section 12.

10. LABORATORY REQUIREMENTS AND METHODS

10.1 Quality Control, Quality Assurance, and Field Records

- (a) Quality control requirements shall be performed in accordance with the laboratory methods specified in this test procedure.
- (b) Each day of sampling, at least one field duplicate sample shall be collected per matrix type (crude oil, condensate, produced water). The field duplicate samples are collected to demonstrate acceptable method precision by the laboratory at the time of analysis. Through this process the laboratory can evaluate the consistency of sample collection and analytical measurements as well as matrix variation. The laboratory should establish control limits based on relative percent difference to evaluate the validity of the measured results.
- (c) Laboratory procedures shall be in place for establishing acceptance criteria for field activities described in sections 7, 8 and 9 of this procedure. All deviations from the acceptance criteria shall be documented. Deviations from the acceptance criteria may or may not affect data quality.
- (d) Laboratory procedures shall be in place to ensure that field staff have been trained on the sampling methods specified in this procedure and retrained on sampling methods if this procedure changes.
- (e) Field records shall provide direct evidence and support necessary for technical interpretations, judgments, and discussions concerning project activities and shall, at a minimum, include a completed copy of Form 1 as provided in this procedure for each sample collected.

10.2 Laboratory Flash Analysis Equipment

- (a) All laboratory equipment used to conduct measurements shall be calibrated in accordance with the manufacturer specifications and in accordance with the laboratory methods specified in this procedure.
- (b) Any chromatograph system that allows for the collection, storage, interpretation, adjustment, or quantification of chromatograph detector output

signals representing relative component concentrations may be used to conduct this procedure. All test methods and quality control requirements shall be conducted in accordance with each laboratory method specified.

- (c) The minimum reporting limit of the instruments used for reporting gaseous compounds must be at least 100 parts per million (ppm) for both hydrocarbon and fixed gases.
- (d) The laboratory apparatus used for heating sample cylinders must be capable of heating and maintaining the steady state temperature measured at the time of sampling as reported on Form 1.
- (e) The laboratory apparatus used for collecting gas flashed from liquids must be capable of precisely measuring gas volume, temperature, and pressure.
- (f) The laboratory vessel used for collecting gas flashed from liquids must be capable of collecting or storing gas for chromatography analysis without sample degradation and without compromising the integrity of the sample.
- (g) Additional sample preparation guidance can be found in GPA 2174-93, GPA 2261-00 and GPA 2177-03.

10.3 Laboratory Flash Analysis Procedure

- (a) Heat the sample cylinder to the sample collection temperature as reported on Form 1 and allow the temperature to stabilize for a minimum of 30 minutes.
- (b) After the cylinder temperature has stabilized, open the cylinder and collect all gas flashed from the liquid for a minimum of 30 minutes while monitoring the gas pressure and temperature.
- (c) After all gas has flashed from the cylinder for a minimum of 30 minutes, ensure that the gas pressure has stabilized at ambient pressure with no changes in gas pressure observed. In the event that the gas pressure changes or remains above ambient pressure after 30 minutes, continue to allow the cylinder to flash until the gas pressure stabilizes at ambient pressure. The collected gas sample can now be used for gas chromatography analysis.
- (d) At least 0.20 standard cubic feet of sample gas per barrel of liquid is required to conduct the laboratory procedures specified in this procedure. If insufficient gas volume is collected during the flash analysis procedure, additional laboratory analyses cannot be completed while maintaining the accuracy requirements specified in this procedure.

- (e) After the flash analysis procedure is completed, remove all liquid from the sample cylinder and measure the total liquid volume and volume fractions (for example, 300ml total volume, 285 ml crude oil, 15 ml water) and adjust for any displacement liquid that was not displaced during the sample collection procedure.

10.4 Gas-Oil and Gas-Water Ratio Calculation Methodology

- (a) Convert the volume of gas vapor measured during the laboratory flash analysis procedure to standard atmospheric conditions as derived from the Ideal Gas Law as follows:

$$Vapor_{Std} = \frac{(Volume_{Lab})(459.67 + 60F)(P_{Lab})}{(459.67 + T_{Lab})(14.696)} \quad \text{Equation 4}$$

Where:

Vapor_{Std} = Standard cubic feet of vapor at 60°F and 14.696 psia.

Volume_{Lab} = Volume of vapor measured at laboratory conditions.

T_{Lab} = Temperature of vapor at laboratory conditions, °F.

P_{Lab} = Pressure of vapor at laboratory conditions, psia.

459.67 = Conversion from Fahrenheit to Rankine

60F = Standard temperature of 60°F.

14.696 = Standard atmospheric pressure, psia.

- (b) Convert the volume of crude oil or produced water measured after conducting the laboratory flash analysis procedure to standard conditions as follows:

$$Liquid_{Std} = \left(\frac{Mass_{Liquid}}{Density_{60F}} \right) \left(\frac{1 \text{ gallon}}{3785.412 \text{ ml}} \right) \left(\frac{1 \text{ STB}}{42 \text{ gallons}} \right) \quad \text{Equation 5}$$

Where:

Liquid_{Std} = Standard volume of post-flash liquid at 60°F, barrels.

Mass_{Liquid} = Mass of liquid at laboratory conditions, grams.

Density_{60F} = Density of liquid at 60°F, grams/milliliter.

3785.412 = Conversion from milliliter to US gallons.

STB = Stock Tank Barrel.

42 gallons = Volume of a stock tank barrel at 60°F.

- (c) Calculate the Gas-Oil or Gas-Water Ratio as follows:

$$G = \frac{(Vapor_{Std})}{(Liquid_{Std})} \quad \text{Equation 6}$$

Where:

G = The Gas-Oil or Gas-Water Ratio.

Vapor_{Std} = Standard cubic feet of vapor at 60°F and 14.696 psia.

Liquid_{Std} = Standard volume of post-flash liquid at 60°F, barrels.

Note: For condensate, the volume of liquid used for calculating the Gas-Oil Ratio shall be obtained from the piston cylinder measurement reported on Form 1 at the time of liquid sampling due to the rapid flashing of condensate that occurs during the laboratory flash analysis procedure.

10.5 Analytical Laboratory Methods and Requirements

The following methods are required to evaluate and report flash emission rates from crude oil, condensate, and produced water.

- (a) Oxygen, Nitrogen, Carbon Dioxide, Methane, Ethane, Propane, i-Butane, n-Butane, i-Pentane, n-Pentane, Hexanes, Heptanes, Octanes, Nonanes, Decanes+: Evaluate per GPA 2286-95, ASTM D-1945-03, ASTM D-3588-98, and ASTM D-2597-10 (GC/TCD).
- (b) BTEX: Evaluate per EPA 8021B (GC/FID) or use ASTM D-3710-95, GPA 2286-95, EPA 8260B, EPA TO-14, and EPA TO-15 as alternate methods.
- (c) API Gravity of whole oil at 60°F by ASTM D 287-92 (Hydrometer Method), ASTM D-4052-09 (Densitometer), ASTM D 5002-16 (Densitometer), or ASTM D-70-09 (Pycnometer). Note: if water is entrained in sample, use ASTM D 287-92. If needed calculate Specific Gravity 60/60°F = 141.5 / (131.5 + API Gravity at 60°F)
- (d) Specific Gravity of Produced Water at 60°F by ASTM D 287-92 (Hydrometer Method), ASTM D 4052-09 (Densitometer), ASTM D 5002-16 (Densitometer), or ASTM D 70-09 (Pycnometer). If needed calculate API at 60°F = (141.5 / SG at 60°F) - 131.5
- (e) Molecular Weight of gaseous phase by calculation per ASTM D-3588-98.
- (f) Water and Sediment in Crude Oil by Centrifuge Method per ASTM D-4007-08.

11. CALCULATING RESULTS

The following calculations are performed in conjunction with the data requirements specified in section 7 and the laboratory reports specified in section 12. The same calculations are used for crude oil, condensate, and produced water.

11.1 Calculate the volume of gas flashed from the liquid per year using the Gas Oil or Gas Water Ratio obtained from the laboratory report as follows:

$$Ft^3/Year = \left(G \right) \left(\frac{Barrels}{Day} \right) \left(\frac{Days}{Year} \right) \quad \text{Equation 1}$$

Where:

$Ft^3/Year$ = standard cubic feet of gas produced per year

G = Gas Oil or Gas Water Ratio (from laboratory report)

$Barrels/Day$ = barrels per day of liquid (Form 1)

$Days/Year$ = days of operation per year (Form 1)

11.2 Convert the gas volume to pounds as follows:

Equation 2

$$Mass_{Gas}/Year = \left(\frac{Ft^3}{Year} \right) \left(\frac{gram}{gram-mole} \right) \left(\frac{gram-mole}{23.690l} \right) \left(\frac{28.317l}{Ft^3} \right) \left(\frac{lb}{454grams} \right)$$

Where:

$Mass_{Gas}/Year$ = pounds of gas per year

$Ft^3/Year$ = cubic feet of gas produced per year (Equation 1)

$Gram/Gram-Mole$ = Molecular weight (from laboratory report)

23.690 l/gr-mole = molar volume of ideal gas at 14.696 psi and 60°F

11.3 Calculate the annual mass of methane as follows:

$$Mass_{Methane}/Year = \left(\frac{WT\% \text{ Methane}}{100} \right) \left(\frac{Mass_{Gas}}{Year} \right) \left(\frac{metric \text{ ton}}{2205 \text{ lb}} \right) \quad \text{Equation 3}$$

Where:

$Mass_{Methane}/Year$ = metric tons of methane

$Mass_{Gas}/Year$ = pounds of gas per year (Equation 2)

$WT\% \text{ Methane}$ = Weight % of methane (from laboratory report)

12. LABORATORY REPORTS

- 12.1** The results of this procedure are used by owners or operators of separator and tank systems to report annual methane flash emissions to ARB. The following information shall be compiled as a report by the laboratory conducting this procedure and provided to the owner or operator each time flash analysis testing is conducted:
- (a) A sketch or diagram of the separator and tank system depicting the sampling location; and,
 - (b) A copy of Form 1 as specified in this procedure for each liquid sample collected; and,
 - (c) The laboratory results for each liquid sample evaluated as specified in section 12.4; and,
 - (d) Other documentation or information necessary to support technical interpretations, judgments, and discussions.
- 12.2** Reports shall be made available to the owner or operator no later than 60 days from the date of liquid sampling.
- 12.3** Reports shall be maintained by the laboratory conducting this procedure for a minimum of five (5) years from the date of liquid sampling and additional copies shall be made available at the request of the owner or operator.
- 12.4** Laboratory reports shall include, at minimum, a listing of results obtained using the laboratory methods specified in this procedure and as specified in Table 1.

Table 1: Laboratory Data Requirements

WT% CO ₂ , CH ₄
WT% C ₂ -C ₉ , C ₁₀ +
WT% BTEX
WT% O ₂
WT% N ₂
Molecular Weight of gas sample (gram/gram-mole)
Liquid phase specific gravity of produced water
Gas Oil or Gas Water Ratio (scf/stock tank barrel)
API gravity of whole oil or condensate at 60°F

Water and Sediment of whole oil (ASTM D-4007-08)
Post-Test Cylinder Water Volume
Post-Test Cylinder Oil Volume

13. ALTERNATIVE TEST PROCEDURES, SAMPLING METHODS OR LABORATORY METHODS

Alternative test procedures, sampling methods, or laboratory methods other than those specified in this procedure shall only be used if prior written approval is obtained from ARB. In order to secure ARB approval of an alternative test procedure, sampling method, or laboratory method, the applicant is responsible for demonstrating to the ARB's satisfaction that the alternative test procedure, sampling method, or laboratory method is equivalent to those specified in this test procedure.

- (1) Such approval shall be granted on a case-by-case basis only. Because of the evolving nature of technology and procedures and methods, such approval shall not be granted in subsequent cases without a new request for approval and a new demonstration of equivalency.
- (2) Documentation of any such approvals, demonstrations, and approvals shall be maintained in the ARB files and shall be made available upon request.

13. REFERENCES

- | | |
|----------------|--|
| ASTM D-70-09 | <i>Standard Test Method for Density of Semi-Solid Bituminous Materials (Pycnometer Method), which is incorporated herein by reference. 2009.</i> |
| ASTM D-287-92 | <i>Standard Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method), which is incorporated herein by reference. Reapproved 2000.</i> |
| ASTM D-1945-03 | <i>Standard Test Method for Analysis of Natural Gas by Gas Chromatography, which is incorporated herein by reference. Reapproved 2010.</i> |
| ASTM D-2597-10 | <i>Standard Test Method for Analysis of Demethanized Hydrocarbon Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography, which is incorporated herein by reference. 2010</i> |
| ASTM D-3710-95 | <i>Standard Test Method for Boiling Range Distribution of Gasoline and Gasoline Fractions by Gas Chromatography, which is incorporated herein by reference. Reapproved 2009.</i> |

ASTM D-3588-98	<i>Standard Practice for Calculating Heat Value, Compressibility Factor, and Relative Density of Gaseous Fuels, which is incorporated herein by reference. Reapproved 2003.</i>
ASTM D-4007-08	<i>Standard Test Method for Water and Sediment in Crude Oil by the Centrifuge Method (Laboratory Procedure), which is incorporated herein by reference. 2008.</i>
ASTM D-4052-09	<i>Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter, which is incorporated herein by reference. 2009.</i>
ASTM D-5002-16	<i>Standard Test Method for Density and Relative Density of Crude Oils by Digital Density Analyzer, which is incorporated herein by reference. 2016</i>
EPA Method 8021B	<i>Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, which is incorporated herein by reference. 2014.</i>
EPA Method 8260B	<i>Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), which is incorporated herein by reference. 1996.</i>
EPA Method TO-14	<i>Determination of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters with Subsequent Analysis By Gas Chromatography, which is incorporated herein by reference. 1999.</i>
EPA Method TO-15	<i>Determination of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters and Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), which is incorporated herein by reference. 1999.</i>
GPA 2174-93	<i>Analysis Obtaining Liquid Hydrocarbon Samples for Analysis by Gas Chromatography, which is incorporated herein by reference. 2000.</i>
GPA 2177-03	<i>Analysis of Natural Gas Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography, which is incorporated herein by reference. 2003.</i>
GPA 2261-00	<i>Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography, which is incorporated herein by reference. 2000.</i>
GPA 2286-95	<i>Tentative Method for the Extended Analysis of Natural Gas and Similar Gaseous Mixtures by Temperature Program Gas Chromatography, which is incorporated herein by reference. Reprinted 1999.</i>

FORM 1
Flash Analysis Testing Field Data Form

Date of Testing:	
Production Company Name:	
Address:	
City:	
Contact:	Phone:
Sampling Company Name:	
Address:	
City:	
Contact:	Phone:
Portable Pressurized Separator ID:	
Pressure Vessel ID:	
Steady State Pressure:	psig
Steady State Temperature:	°F
Crude Oil or Condensate Throughput:	Barrels/Day
Produced Water Throughput:	Barrels/Day
Gas Flow Rate (if metered):	Mcf/Day
Days of Operation of Separator and Tank System per Year:	
Percent Water Cut: %	Number of wells in system:
Sample Type (circle one): crude oil condensate produced water	
Sample Cylinder ID Number:	
Cylinder Type:	Displacement Liquid:
Cylinder Volume: ml	Volume of Liquid Collected: ml



CENTER ON
RACE, POVERTY
& THE ENVIRONMENT



Alliance of Nurses For Healthy
Environments



July 18, 2016

California Air Resources Board

1001 "I" St.

Sacramento, CA, 95814

Via Electronic Submittal:

http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=oilandgas2016&comm_period=A

Re: Letter of Support and Suggested Improvements for the Revised Draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

The undersigned organizations would like to submit this letter in support of the proposed rule to regulate greenhouse gas emissions from oil and gas facilities in California.

We commend California Air Resources Board ("CARB") staff for drafting a proposal that directly regulates methane and associated emissions from a diverse suite of new and existing oil and gas sources. Many of the provisions contained in the draft represent models for the nation, including the quarterly baseline inspection requirement for facilities, the continuous ambient air quality monitoring requirement for natural gas storage facilities, and the prioritization of natural gas capture over combustion requirements for a suite of equipment. Nevertheless, there remain opportunities to further enhance the public health and welfare benefits of the rule, and to showcase California as the foremost leader in tackling serious clean air and environmental issues.

OP-11-1

As a growing body of evidence demonstrates, there are significant negative public health and environmental impacts associated with pollution from oil and gas - and communities living nearby are the ones most affected. Studies show that along with the release of strong climate pollutants like methane, oil and gas production releases harmful co-pollutants like volatile organic compounds that contribute to ozone formation that impact lung health, and toxic chemicals like benzene, which is a known human carcinogen. The communities most impacted by oil and gas pollution are often low-income communities and communities of color that are already disproportionately vulnerable to socio-economic and environmental hazards. Residents of the most impacted communities throughout California, many of which live less than 30 feet away from production facilities, have experienced firsthand the harmful effects of oil and gas pollution. Reported symptoms from residents living near oil and gas operations have included onset of asthma and other respiratory problems, nausea, dizziness, loss of smell, and frequent migraines. Additionally, science shows that our most vulnerable and defenseless populations - children, pregnant women, and the elderly - are most susceptible to experiencing negative health impacts from oil and gas pollution.

In order to ensure that the proposed regulation results in maximum reductions in emissions that harm community health, we support CARB in its efforts to strengthen the leak detection and repair requirements applicable to facilities with the potential to leak or inadvertently vent harmful pollutants. Specifically, by removing the step down provision from the proposed draft, the rule is greatly strengthened. By allowing operators to move to relaxed annual inspection standards if leaks are not detected in the first five quarters, operators are dis-incentivized to properly detect, report, and repair leaks. Additionally, due to the century-old infrastructure that exists in most of the state, leaks may happen at any time, and strict quarterly inspections are critical for catching leaks when they are still small and manageable, and before they turn into another Aliso Canyon-scale catastrophe. For these reasons, we believe that in order for the rule to be effective in protecting the health of our families, the step down provision must be removed.

OP-11-2

Additionally, we are concerned that the timeframe for implementing the rule has slipped by approximately one year, and believe that the implementation date should be reviewed. While we understand the need to ensure adequate time for Air District staff and industry to prepare for administration and compliance with the rule, we urge CARB to implement the rule expeditiously with no further delays, so that communities can begin experiencing the critical clean air protections afforded by the rule's many strong provisions.

OP-11-3

Thank you for taking seriously the concerns of our communities.

Sincerely,

Irene Burga, JD
Oil and Gas, Environment Justice Fellow
Environmental Defense Fund

Madeline Stano, JD
Staff Attorney
Center on Race, Poverty & the Environment

Vinai Decena RN, PHN
Northern California Program Coordinator
Alliance of Nurses for Healthy Environments

Bonnie Holmes-Gen
Senior Director, Air Quality and Climate Change
American Lung Association in California

Scott Takahashi, PharmD
Chair
Asthma Coalition of Los Angeles County

Taylor Thomas
Research and Policy Analyst
East Yard Communities for Environmental Justice

Gisele Fong, PhD
Executive Director
EndOil

Bill Magavern
Policy Director
Coalition for Clean Air



July 18th, 2016

California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

RE: California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4. Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

To Whom It May Concern:

FLIR Systems has demonstrated a long history of working collaboratively with the Oil & Gas Industry to offer methane and VOC mitigation solutions that are both efficient and effective at locating sources of fugitive emissions. As the pioneer of Optical Gas Imaging (OGI), we would like to take this opportunity offer our feedback on the specifics outlined in the docket.

Over the past 10 years, we have performed considerable research to gather information from our customer base regarding the effectiveness and affordability of implementing OGI programs across the globe. In doing so, we have found it reasonable to believe that operating a frequent OGI program can be a consistently economical way to realize low abatement costs for methane. This is of course a realization that puts more sales gas into the line, therefore increasing the profitability of the operator.

OP-12-1

A specific example comes from one of our customers, Jonah Energy, who has operations in WY (Sublette County). Jonah Energy has publicly stated that their monthly Leak Detection and Repair program using OGI technology has not only been effective, but it has been consistently profitable. The cumulative gas savings realized by the program has exceeded \$5 million in the past 6 years, which has more than covered the overall program costs. This includes the Optical Gas Imaging equipment and associated operators, along with all repairs and maintenance, including labor and parts. Recently, Jonah Energy shared their experience in the public comments submitted to the WY Depart of Environmental Quality Air Quality Division, saying¹:

"Each month, Jonah Energy conducts infrared camera surveys using a FLIR camera at each of our production facility locations. Since the implementation of Jonah Energy's Enhanced Direct Inspection and Maintenance Program in 2010, we have conducted over 16,000 inspections and have repaired thousands of leaks that were identified by the FLIR camera. Based upon a market value of natural gas of \$4 per million Btu, the estimated gas savings from the repair of leaks identified exceeded the labor and material cost of repairing the identified leaks. Additionally, an estimate of hundreds of tons of volatile organic compound emissions have been eliminated from being emitted to the atmosphere.

OP-12-2

The result of Jonah Energy use EDI&M Program has significantly reduced volatile organic compound and hazardous air pollutant emissions to the Upper Green River Basin airshed, has reduced the amount of sales gas lost due to leaks going undetected resulting in significant sales gas savings, and has reduced the number and severity of enforcement actions from the Wyoming Department of Environmental Quality due to fugitive leaks."

Our experience developing OGI technology, working with personnel from both industry and regulatory agencies, and training hundreds of OGI technicians each year informs the following constructive comments.

OP-12-2
cont.

Comparing OGI to Method 21

The efficiency of OGI technology is tied to its unique ability to help operators visualize leaks and directly see their source. Due to this fact, the adverse effects of wind (direction and speed) on the emissions plume are less extensive as compared to other approved technologies. Figure 1 below demonstrates a common example where a Method 21 approved device (TVA) is not able to identify a laboratory produced methane leak when wind direction diverts the plume away from the instrument probe.

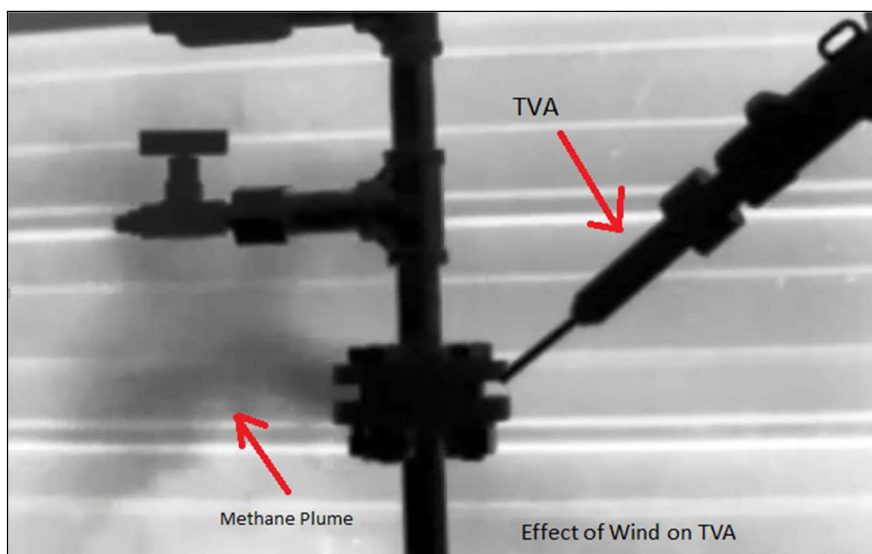


Figure 1–Lab testing shows adverse effects of wind direction on probe-type TVA instrument

OP-12-3

Alternatively, the plume is easily detectable with OGI technology since the entire surrounding area is being passively monitored. This of course allows for the operator to actually see the source of the leak, preventing repair errors and eliminating false positives where blowing emissions are present at surrounding components. This concept also lends to the realization that LDAR programs utilizing OGI are considerably more efficient, as the technology allows operators to scan hundreds of components simultaneously². This of course is a critical parameter to consider when scaling up frequent inspections in a cost-effective way.

Additionally, OGI technology has been proven to be more effective at locating leaks in confined spaces and hard to reach areas, reducing the need for scaffolding and man-lifts. Since many components at a well site or compressor station are physically difficult to reach and/or require an operator to be put in harm's way when accessing, an imaging technology has an inherent benefit over probe type instruments that must be submerged within the emissions plume. The Mandatory Reporting of Greenhouse Gases Rule (75 FR 74458) in its inception accurately identified this principal via the following verbiage³:

OP-12-4

An optical gas imaging instrument must be used for all source types that are inaccessible and cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface...EPA still requires the use of optical imaging cameras to reach inaccessible emission sources where the reporter cannot use Method 21 compliant leak detection equipment safely.

OP-12-4
cont.

Lastly, the latest EPA 0000a Methane Rule (NSPS) and associated Technical Support Document for Optical Gas Imaging Protocol both reference detailed information compiled regarding Optical Gas Imaging, including:

- EPA's Justification for identifying Optical Gas Imaging (OGI) as the "Best Systems for Emissions Reduction"
- Numerous studies comparing OGI to Method 21 and other forms of leak detection
- Performance Tests for OGI in various conditions

The rule validates Optical Gas Imaging as the Best System of Emissions Reduction (BSER) for Oil & Gas well sites, and Compressor Stations (booster/gathering) across the United States, as the following applies to all new/modified equipment:

OP-12-5

The updated NSPS requires that owners/operators of natural gas well sites develop and implement a leaks monitoring plan. Owners/operators must use a technology known as optical gas imaging to conduct a leaks survey. Optical gas imaging equipment uses a special camera to "see" emissions of methane and VOCs.

- Owners/operators may use "Method 21" as an alternative to optical gas imaging. Method 21 is an EPA method for determining VOC emissions from process equipment. The method is based on using a portable VOC monitoring instrument, such as an organic vapor analyzer (sometimes referred to as a "sniffer").

Technical Support Document Appendices, Optical Gas Imaging Protocol (40 CFR part 60, Appendix K), August 11, 2015⁴

Reference to Studies:

STUDY [5] - Directed Inspection and Maintenance Leak Survey at a Gas Fractionation Plant Using Traditional Methods and Optical Gas Imaging. (Picard, D., J. Panek, D. Fashimpaur. 2006)

The same screening rate inequality was found in a different study by Picard et al.⁷⁸ at a gas fractionation plant, where the implementation of OGI technology increased the screening speed nearly 10-fold.⁷⁸ For a two person team using Method 21, a rate of 240 components per hour was a reasonable pace. A two person team using OGI increases that rate to 2,300 components per hour.⁸¹ Of the top 10 biggest leakers found during this study, operators only found 5 while using Method 21, but found 8 while using OGI technology (the other 2 leaks having sufficient mass emission rates to be detected by the camera, but were missed by the operator⁸¹). While the study emphasized the detection performance for the top 10 leaks, there was no comparison of performance over the entire size range of leaks. Additionally, this study found that as compared

STUDY [6]: Smart LDAR: Pipe Dream or Potential Reality? Exxon Mobile Corporation (Reese, D., C. Melvin, and W. Sadik. 2007)

During a study by Reese et al., 2006, it was determined that only two people were required for 2 days to do an OGI technology-assisted facility survey versus four people for 4 days using Method 21.⁸⁰ In this study, the authors allowed some leaks that were less than the regulation definition of 10,000 ppm to go unrepaired to evaluate the concern over the potential for leaks at lower mass emission rates to become bigger over time. These equipment leaks were re-surveyed three months after the initial Method 21 survey. Although some leak rates increased over that time, an equivalent amount of leaks decreased, resulting in no net change over time and resulting in the authors unable to find any correlation between leak rate and length of time.

Reese et al. reported that, during the last comparison survey conducted for this study, only one leak was detected with OGI technology and nine leaks were detected with Method 21 independently. In this example, although the Method 21 survey found more leaks, the maximum leak concentration detected by Method 21 was 5,817 ppm. In comparison, the one leak found by OGI technology measured 210,000 ppm; this was the largest leak of the study, and it was not detected via Method 21. Therefore, lower whole-facility emissions can result from the implementation of OGI technology-assisted leak surveys due to the greater probability of a large leak being detected with OGI versus Method 21 only. Reese et al.⁸⁰ reached this conclusion after observing that OGI consistently found the larger leaks, although some leaks were missed starting around 6,000 ppm (according to EPA Method 21 measurements) and less.⁸⁰ In the study, the authors applied the EPA correlation curves¹⁰⁶ to Method 21 screening values and the API leak/no-leak emission factors^{2,3,59,60} to come up with whole facility emission rates of 9,099 pounds per year (lbs/yr) for Method 21 and 7,774 lbs/yr for OGI. This was a difference of about 15%, which was acceptable to the authors.⁸⁰ The study authors concluded that the use of OGI technology to assist LDAR surveys results in lower whole-facility emissions versus Method 21 alone and that the amount of emissions released by smaller leaks possibly missed by OGI technology-assisted surveys are offset by the faster identification (and repair) of larger leaks when surveys are conducted on a more frequent basis.

STUDY [7]: Refinery Evaluation of Optical Imaging to Locate Fugitive Emissions (Robinson – AWMA)

2006-2007. Furry et al., 2006; Reese et al., 2007 and Trefiak, 2006 reported for industry on LDAR applications and technology challenges. These reports all agree that the implementation of Method 21 is timely and expensive, while advancing technologies offer promise to streamline and reduce the cost of routine monitoring.^{35,80,98} A paper by Robinson et al. in 2007 found that using OGI technology to assist the periodic screening procedures increases the survey rate of equipment dramatically from about 60 pieces of equipment per hour with Method 21 to over 2,000 pieces of equipment per hour with OGI technology and that OGI technology-assisted surveys identified 97% of the total mass emissions detected from leaking sources with Method 21.⁸⁵ These studies provided evidence that using OGI technology to assist LDAR programs with their regular equipment surveys promises to be a quicker and more cost-effective method of identifying the largest sources of leaking emissions relative to Method 21 and will increase the amount of total facility fugitive emissions reduction because OGI technology can identify fugitive emissions from all equipment categories, regardless of whether that equipment is mandated for LDAR program compliance or not.

In summary, we believe that the minimal adverse effects of wind, increased inspection efficiency, and inaccessibility of common components would support the agency's allowance of Optical Gas Imaging as fully acceptable alternative to Method 21 for Leak Detection.

OP-12-6

Evolution of OGI Technology

Continuous Monitoring

It is important to note that Optical Gas Imaging is continually evolving. Recently, fixed mounted OGI cameras have been developed offering Continuous Emissions Monitoring and Automated Leak Detection in remote areas. Through this technology, operators can autonomously detect, visualize, and pinpoint hydrocarbon and methane leaks in a variety of industrial environments, including underground storage facilities, to streamline operations by protecting profits, improving health & safety standards, and reducing environmental impacts.

Quantification

When analyzing the financial impact of OGI programs, it is relevant to consider the fact that the economic value of the conserved gas commonly exceeds the associated repair cost of the leaking equipment. A recent study by Carbon Limits, Quantifying Cost-effectiveness of Systematic Leak Detection and Repair Programs Using Infrared Cameras⁸, sheds light on the finding that 97% of leaks identified with OGI technology are profitable to repair even with the price of natural gas at \$3/Mcf. Moreover, 90% of the gas emissions are from leaks that can be repaired with a payback period of less than one year. This study was based on data from 58,421 emissions sources at 4,293 Oil & Gas facilities across the United States and Canada.

This supports the notion that operators are already incentivized to repair leaks that are found with Optical Gas Imaging. Therefore, we believe that it would be reasonable to allow Optical Gas Imaging be an acceptable alternative to Method 21, where a leak found is considered "a leak" with a fixed repair timetable.

If quantification is considered critical information, there is now software technology through Providence Photonics (QL100) available today that enhances Optical Gas Imaging by offering real-time leak rate and volume quantification, which should be considerably more meaningful to operators and regulators than concentration data (ppm). This concept is called quantitative Optical Gas Imaging or qOGI.

Costs & Availability of OGI Equipment

FLIR Systems is a world leader in the design, manufacture, and marketing of sensor systems that enhance perception and awareness. We are also the pioneer of Optical Gas Imaging (OGI) technology. Recently, the costs and availability of OGI equipment and trained personnel has been brought into question; therefore we would like to take this opportunity to address this concern by offering some insight into how our operations can be scaled and how the technology can be accessed by smaller producers.

OP-12-7



Production

With multiple production facilities across the United States and robust financials (2015 Revenue of \$1.6B), we are appropriately positioned to scale the production of OGI equipment as needed. The main reason for this is because FLIR is truly vertically integrated, as we own and operate the large majority of our supply chain. This begins with the IR detector and cryo-cooler assembly, which are the core components of an OGI camera. These are both created solely by FLIR and are also used in a wide variety of other imaging, thermography, and security products, including airborne and ground-based surveillance systems. The large majority of these products are Commercial-off-the-shelf (COTS) systems, which require us to have true scalability for spikes in growth across multiple markets.

We have thoroughly reviewed our production capacity of key components and have confirmed that even a 3X increase in demand of GF320/GF300 cameras would fit within the existing production growth plan for cooled sensor engines slated for 2016. Larger increases in demand would not require equipment or infrastructure expansion and could be scaled quickly, likely within the span of time between the finalization of a BLM rule and implementation.

We have been specifically asked by the Alberta Energy Regulator if we could build and deliver an additional 300 GF320/GF300 cameras in the next calendar year. The answer is yes, quite easily, as our current production capacity far exceeds this estimated increase in demand.

Service & Training

Additionally, we have confirmed internally that we can also appropriately scale the associated service of equipment and training of individuals via our Infrared Training Center (ITC). It is important to note that FLIR has service locations all over the world that currently work on thousands of IR cameras every month. We have confirmed internally that we can reallocate resources to handle an increase in service demand fairly easily.

With regards to training, FLIR offers Optical Gas Imaging courses both at our corporate headquarters and locally through engineers and direct employees in the field. Our Infrared Training Center has reported that it would take approximately 30 days to double the monthly amount of individuals trained on Optical Gas Imaging and 60 days to triple the number.

Rental & Leasing

Many options exist for OGI inspections beyond the purchase of an OGI camera. For example, rental cameras are available from FLIR as well as other equipment rental companies that service the industry. Here is quick snapshot of today's GF320 rental rates:

FLIR 7-Day Rental Rate = \$3,950

FLIR 3-day Rental Rate = \$1,975

It is conservative to estimate that an operator could scan 4 full locations in a day, depending on distance between sites. Therefore, a 7-day rental would allow for a minimum of 28 inspections. This brings the per site cost to ~\$141.

Service Providers & Contractors

Over the past 10 years, there have been a large number of service consultants using OGI equipment created throughout the country. This is mostly evident by our internal evaluation of attendees to our frequent and regional OGI training courses. We have seen a considerable shift from in-house operators to third party contractors in recent years.

Additionally, this group can be rapidly expanded through existing training and equipment leasing programs. Furthermore, we have recently seen a transition where many field-service companies are leveraging OGI surveys as a way to re-invent themselves in a market where they already have considerable expertise. We expect this transition to continue with the increased adoption of new inspection technologies, such as Optical Gas Imaging.

Our surveys of FLIR customers that provide consultant services showed average rates of \$250-350 per visit. Internal OGI programs showed costs that were lower and in the range of \$150-170 per site visit.

In conclusion, we have made great strides over the years to ensure that OGI technology can be accessible at a reasonable and low cost to the industry. Additionally, FLIR is well positioned to swiftly scale our OGI business to meet any new demand, thus ensuring that the necessary equipment and personnel will be available to perform monitoring and inspection programs irrespective of frequency.

Performance Methods for OGI Technology

There are many types of IR cameras produced today that visualize light in a wide variety of wavelengths within the IR spectrum, most of which are not tuned to see any type of hydrocarbon gas. We recommend that the agency consider a detailed definition of “Optical Gas Imaging” to ensure that the equipment used for leak detection surveys is intended for methane and hydrocarbon gas detection. For example, Optical Gas Imaging can be defines as *an instrument that employs spectral wavelength filtering and an array of infrared detectors to visualize the infrared absorption of hydrocarbons and other gaseous compounds.*

OP-12-8

Also, we recommend that the agency consider instituting an equipment performance verification method to ensure the IR camera used is specifically capable of imaging methane or other hydrocarbon gases at a flow rate that aligns with the agency’s goals. A comprehensive and verifiable method would be the NECL method proposed in the Draft Technical Support Document Appendices, Optical Gas Imaging Protocol (40 CFR Part 60, Appendix K), August 11, 2015 which states:

OP-12-9

“Similar to the way in which the noise equivalent temperature difference (NETD) is used to characterize the performance of thermometric instruments by defining the smallest amount of temperature difference that can be definitively measured above noise levels (like the limit of detection in analytical chemistry), the NECL describes the performance limitations for OGI cameras in terms of the lowest ppm•m that can be detected above the baseline noise.”

We fully support the NECL approach, as it is the most comprehensive method for comparing Optical Gas Imaging equipment and verifying their ability to visualize a particular gas of interest.

Additionally, this is a performance method that could be certified by the manufacturer upon production, thereby reducing the burden on industry.

OP-12-9
cont.

Calibration Requirements

It is important to note that there is no periodic calibration required for Optical Gas Imaging technology when used as a tool for gas detection. Previous references to calibration requirements was intended for operators using the camera for temperature measurement activities (i.e. electrical/mechanical inspections). If the system is used solely for gas detection, there is no manufacturer's re-calibration recommendation.

We have updated our manual to communicate this more effectively.

Notice to user

3.1 User-to-user forums

Exchange ideas, problems, and infrared solutions with fellow thermographers around the world in our user-to-user forums. To go to the forums, visit:

<http://www.infraredtraining.com/community/boards/>

3.2 Calibration

Gas detection: no re-calibration recommendation. The ability to detect gases is not influenced by the calibration and will not degrade over time.

Temperature measurement: annual re-calibration recommended.

Here is a link to the latest FLIR GFXXX Series manual for reference:

<http://support.flir.com/DocDownload/app/RssDocDownload.aspx?ID=20296>

Daily Instrument Check

In the past, there have been references to a Daily Instrument Check for Optical Gas Imaging equipment. It is extremely important to note that as long as an OGI system turns on and is outputting an image, it will see gas with the same sensitivity and detection limit as it did on its manufacturing date. This is mainly due to the fact that the internal "cold-filter" that allows an OGI system to target the absorption characteristics of hydrocarbon gases does not degrade or change properties over time. Only systems that quantify emissions should require a periodic instrument check, as they need to verify that there has not been any measurable drift to an existing calibration. Therefore, a daily instrument check for OGI equipment would unnecessarily increase the cost of implementing an OGI program, while offering no value in exchange.

OP-12-10

In summary, we are pleased that OGI technology is recognized as an acceptable screening tool, but believe that the details outlined above justifies consideration for Optical Gas Imaging to be adopted as a fully acceptable alternative to Method 21 for Leak Detection.

OP-12-11



The World's Sixth Sense™

Thank you greatly for providing the opportunity for us to submit comments to the proposed ARB rule.

Sincerely,

A handwritten signature in black ink that reads "Mark Boccella". The signature is fluid and cursive, with a long horizontal stroke at the end.

Mark Boccella
Americas Business Development Manager
Optical Gas Imaging
FLIR Systems, Inc.
9 Townsend West
Nashua, NH 03063
Phone: 800 745 4620
Email: mark.boccella@flir.com

References:

- (1) *COMMENT RESPONSE CONCERNING THE PROPOSED WYOMING AIR QUALITY STANDARDS AND REGULATIONS, CHAPTER 8, SECTION 6, NONATTAINMENT AREA REGULATION* – February, 2015
- (2) *Conoco Philips PILOT STUDY: Optical Leak Detection & Measurement*, October 2006
- (3) *Mandatory Reporting of Greenhouse Gases Rule* (74 FR 56260)
- (4) *Technical Support Document Appendices, Optical Gas Imaging Protocol* (40 CFR part 60, Appendix K), August 11, 2015 - <https://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2010-0505-4949>
- (5) *Directed Inspection and Maintenance Leak Survey at a Gas Fractionation Plant Using Traditional Methods and Optical Gas Imaging*. (Picard, D., J. Panek, D. Fashimpaur. 2006)
- (6) *Smart LDAR: Pipe Dream or Potential Reality?* Exxon Mobile Corporation (Reese, D., C. Melvin, and W. Sadik. 2007)
- (7) *Refinery Evaluation of Optical Imaging to Locate Fugitive Emissions* (Robinson – AWMA)
- (8) *Carbon Limits, Quantifying Cost-effectiveness of Systematic Leak Detection and Repair Programs Using Infrared Cameras*. March 2014



July 18, 2016

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95812

**Re: INGAA's Comments on the CARB Proposed Regulation for Greenhouse Gas
Emission Standards for Oil and Natural Gas Facilities**

Clerk of the Board:

The Interstate Natural Gas Association of America (INGAA), a trade association of the interstate natural gas pipeline industry, respectfully submits these comments in response to the California Air Resources Board (ARB) proposed regulation, "Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities" (Proposed Rule). The Proposed Rule and support documents were released on May 31, 2016, and INGAA welcomes the opportunity to provide comments. These comments are submitted on several specific issues in the Proposed Rule that introduce new approaches for methane standards or compliance approaches for natural gas transmission and underground storage facilities.

Natural gas provides 25 percent of the basic energy needs in the United States. INGAA's members represent the vast majority of the interstate natural gas transmission pipeline companies in the United States, including two in California. INGAA's members operate approximately 200,000 miles of pipelines and many compressor stations and underground natural gas storage facilities, and serving as an indispensable link between natural gas producers and consumers. The North American natural gas pipeline system is an energy highway that is the envy of the world. INGAA and its members have a long history of working collaboratively with a variety of stakeholders on air quality and greenhouse gas (GHG) issues, including the U.S. EPA and State agencies. INGAA appreciates your consideration of these comments. Please contact me at 202-216-5930 or tboss@ingaa.org if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Terry Boss". The signature is written in a cursive, flowing style.

Terry Boss
Senior Vice President of OS & E
Interstate Natural Gas Association of America
20 F Street, N.W., Suite 450
Washington, DC 20001
(202) 216-5930

**INGAA COMMENTS ON CARB PROPOSED RULE,
“GREENHOUSE GAS EMISSION STANDARDS FOR CRUDE OIL AND
NATURAL GAS FACILITIES”**

**California Code of Regulations, Title 17, Division 3, Chapter 1,
Subchapter 10 Climate Change, Article 4**

PROPOSED REGULATION ORDER

**Subarticle 13: Greenhouse Gas Emission Standards for
Crude Oil and Natural Gas Facilities 6**

July 18, 2016

The Interstate Natural Gas Association of America (INGAA) appreciates the opportunity to submit these comments in response to the California Air Resources Board (ARB) proposed rule, “Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities” (Proposed Rule). An overview of INGAA comments and recommendations includes:

- | | |
|--|------------------|
| 1. It is premature for the ARB to propose monitoring standards for natural gas storage facilities until recommendations from the Aliso Canyon natural gas task force and Federal minimum standards are issued, per the PIPES Act of 2016. In the interim, INGAA recommends the use of established consensus standards for pipeline safety to minimize methane emissions from leaks. |
OP-13-1
 |
| 2. Technologies for continuous ambient and wellhead monitoring of natural gas storage facilities are currently not technically proven. The performance of these technologies is still being evaluated, and they have not been commercially demonstrated at this scale. Continuous ambient and wellhead monitoring should not be required. INGAA recommend the use of established consensus standards for pipeline safety to minimize methane emissions from leaks. |
OP-13-5
 |
| 3. The Proposed Rule includes leak detection and repair (LDAR) requirements that differ from established regulatory approaches and recent federal regulatory requirements (e.g., NSPS Subpart OOOOa). For natural gas transmission and storage (T&S) facilities, INGAA recommends: eliminating performance criteria that limit the <i>number</i> of leaks based on component population counts, revising requirements related to survey frequency and operator training, and, revising delay of repair provisions. |
OP-13-19
 |
| 4. The Proposed Rule includes requirements for upstream storage tanks, separators, and production wells, which do not appear to apply to natural gas transmission and storage (T&S). For T&S segments, applicability of tank and separator requirements should be clearly indicated. Production wells and underground natural gas storage wells should be clearly differentiated. |
OP-13-29
 |

Detailed comments follow.

Detailed Comments

- | | |
|---|-----------------|
| 1. It premature for the ARB to propose monitoring standards for natural gas storage facilities until recommendations from the Aliso Canyon natural gas task force and Federal minimum standards are issued, per the PIPES Act of 2016. In the interim, INGAA recommends relying on recently developed consensus standards (API RP 1170 and API RP 1171) and eliminating the requirements in §95668(i). |
OP-13-1
 |
|---|-----------------|

Potential Federal Regulations and Consensus Standards Can Address Storage Field Concerns

On June 22, 2016 President Obama signed federal legislation, the PIPES Act of 2016.¹ Section 12 of the PIPES Act requires the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) to issue safety standards for underground storage facilities within 2 years. The Act states that “The Secretary *may* authorize a State authority

OP-13-1
cont.

¹ Protecting our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2016, Pub. L. No. 114-183 (June 22, 2016) (codified as U.S.C. § 60141).

(including a municipality) to participate in the oversight of underground natural gas storage facilities ... A State authority may adopt additional or more stringent standards for intrastate underground natural gas storage facilities *if such standards are compatible with the minimum standards prescribed under this section.*”² The Act also requires PHMSA to take into consideration the recommendations of the Aliso Canyon natural gas leak task force in developing minimum safety standards for underground natural gas storage facilities. Specifically, the task force must: (i) analyze and develop conclusions regarding the cause and contributing factors of the recent Aliso Canyon natural gas leak, (ii) analyze the measures taken to stop the leak and alternatives that could have been used instead, (iii) develop an assessment of the impacts of the leak on health, safety and the environment, and (iv) analyze how local, State and Federal agencies responded to the incident. Congress provided the task force with up to 180 days – or December 19, 2016 – to prepare a report summarizing its findings on these issues. The deadline to form this task force was mere days ago (July 7, 2016). Given that PHMSA has yet to issue Federal minimum standards for natural gas storage wells and the Aliso Canyon task force has yet to issue a final report summarizing its findings and recommendations, it is premature for the ARB to propose monitoring standards for natural gas storage wells at this time.

OP-13-1
cont.

Also, the U.S. EPA has initiated a process to develop performance standards for oil and gas facilities, including natural gas storage, through a Notice requesting comment on an existing oil and gas industry Information Collection Request (ICR). The ICR will require companies to submit detailed information on equipment, operations, emissions, controls, and costs. EPA plans to complete the ICR process in early 2017 and use that information to develop an existing source regulation.

OP-13-2

Prior to the recent storage field incident in the Los Angeles area, INGAA and others undertook an effort to develop best practices that provide guidance to operators on how to design, operate, and ensure the integrity of underground natural gas storage. Along with INGAA, trade associations that address all segments of the natural gas industry, including the American Petroleum Institute (API) and American Gas Association (AGA), participated in an effort to develop consensus practices and standards. This culminated in the release of two recommended practices (RP) in September 2015 accredited by the American National Standards Institute (ANSI). API RP 1171³ addresses storage in depleted hydrocarbon reservoirs and aquifer reservoirs, which comprise the vast majority of storage fields. API RP 1170⁴ addresses storage in salt caverns. Trade association members have committed to these practices through board resolutions, and the practices are being implemented by individual companies.

OP-13-3

The new consensus standards and recent, planned, and potential new federal regulations provide platforms to address storage field integrity, safety, and environmental concerns. INGAA recommends relying on those initiatives and eliminating the proposed storage monitoring requirements in §95668(i).

² *Id.*

³ Summary – API Recommended Practice 1171©,
http://www.api.org/~media/files/publications/whats%20new/1171_e1%20pa.pdf.

⁴ Summary – API Recommended Practice 1170©,
http://www.api.org/~media/files/publications/whats%20new/1170_e1%20pa.pdf.

The California Department of Conservation, Division of Oil, Gas & Geothermal Resources (DOGGR) has also released draft *Requirements for Underground Gas Storage Projects*.⁵ These draft regulations also include monitoring/screening requirements. If ARB elects to retain the proposed monitoring requirements, INGAA urges ARB to work with DOGGR to develop consistent requirements before any new regulations from ARB or DOGGR come into effect.

OP-13-4

- 2. The Proposed Rule includes natural gas storage facility monitoring requirements in §95668(i) that are not feasible based on currently proven technologies. The economic analysis should be revised and benefits should be estimated to support the proposed monitoring requirements. INGAA recommends relying on recently developed consensus standards (API RP 1170 and API RP 1171) and eliminating the requirements in §95668(i).**

Proposed Continuous Monitoring Technology is Not Proven

The continuous monitoring technology for storage facility monitoring required by §95668(i)(1)(A) and (C) is not proven, because these provisions primarily rely upon the use of optical gas imaging (OGI), which is a periodic screening device used to *qualitatively* identify leaking components. OGI does not quantify leak volumes or leak rates. §95668(i)(1)(A) – (C) provides a list of three monitoring requirements. The requirements include: (A) Continuous monitoring of the ambient air. (B) Daily screening of each storage wellhead assembly and surrounding area within 200 feet of the wellhead; or (C) Continuous monitoring of each storage wellhead assembly and surrounding area within 200 feet of the wellhead. ARB background documents (e.g., Economic Analysis cost estimates) imply that ARB intends for condition (A) to apply, plus either (B) or (C). There are technological issues associated with the continuous monitoring proposed in subsections (A) and (C). A comment below also reviews the economic analysis for these three options, including the daily “manual inspection” option in subsection (B). Cost considerations are superseded by the technological issues.

OP-13-5

The Economic Analysis and other support documents provide minimal detail on the automated monitoring technologies considered by ARB, and the cost estimates are based on either (1) applying optical gas imaging (OGI) with costs apparently based on presumed costs for infrared (IR) camera, such as the FLIR camera or (2) a combination of unspecified ultrasonic monitors and IR detectors. Thus, it appears ARB anticipates OGI would be used in a continuous operating mode. While INGAA members have used OGI for periodic leak surveys, INGAA does not believe that commercial technologies are available for continuous monitoring. This perspective is supported by the U.S. Department of Energy (DOE), which launched a program to address this technology gap, as discussed below.

OP-13-6

Although vendors are attempting to adapt OGI for continuous operation, its market entry and use to date for methane detection is as a hand held camera for short term field tests rather than continuous operation. OGI functionality provides leak *detection*, but does not quantify leak rates or provide quantitative assessments such as changes from a baseline level, which is a performance metric in the Proposed Rule. ARB background documents also indicate ultrasonic meters could be used for monitoring. There is no detail on such technology, commercial

OP-13-7

⁵ Requirements for California Underground Gas Storage Projects, Discussion Draft, §1726 (Jul. 8, 2016)

products, or its application. INGAA does not agree with ARB conclusions that such technology is available to meet rule requirements.

OP-13-7
cont.

ARB improperly assumes the availability of a commercial system for fixed mounted leak detection that requires little or no user intervention. For methane detection, OGI is currently used as a hand held instrument requiring human interface for leak determination. This technology has not been commercially implemented at compressor stations or storage fields for the purpose of autonomous ambient monitoring or for leak detection. FLIR, the leading OGI technology provider, has investigated gimbal mounted systems for use in fixed mount applications, but software, system integration, communication, audible and visual alarm or warning system development and integration still need to be tested and validated. Then, performance would need to be proven for the application and distances associated with storage wellheads and associated equipment. For such use, additional concerns would need to be addressed such as intrinsic safety requirements, labor from human intervention to investigate false positives, QA/QC criteria (e.g., calibrations, periodic audits) for continuous operation, and an alternative optics (e.g., telephoto lens) to allow storage wellhead surveying at greater distances.

OP-13-8

In addition, ARB envisions monitoring that includes a performance metric requiring action when levels vary by more than 10% from a baseline. This monitoring paradigm is not established and is highly uncertain. It is unclear how such monitoring would be implemented for the two technologies noted by ARB – i.e., OGI or ultrasonic meters. For example, because methane is ubiquitous in the atmosphere from natural and anthropogenic sources, monitoring ambient methane levels would raise site-specific technical challenges that would differ for every storage field, such as: proximity to and prevalence of other methane sources (e.g., agricultural operations, wetlands); natural variability on an hourly, daily, and seasonable basis; wind direction and wind speeds; site topography; other meteorological effects; and surrounding area topography, buildings, and other physical features. In addition, maintenance and other operational activities could result in short term “deviations from a baseline” that actually result from standard and accepted practices. Thus, both operational and natural influences (e.g., natural diurnal affect depending on meteorology) imply that a “static” baseline is not appropriate, further complicating the ability to assess “performance.” Developing the basis for establishing a “baseline,” and inherent variability from “normal” scenarios, would likely become a complex research program, and months or years of monitoring could be required to understand the associated uncertainty and variability.

OP-13-9

In addition to establishing a baseline, establishing an action level at a 10% deviation includes analogous complexities. OGI technology is not suited for assessing a quantitative change and has not been proven in that capacity. OGI *detects* methane but does not otherwise determine or quantify an associated measurable value. There are obvious and huge technical challenges in relying on OGI for the monitoring required by §95668(i)(1)(A) or (C). It is also unclear how ultrasonic technology noted by ARB would be used in this capacity.

OP-13-10

Technology gaps for methane monitoring have been acknowledged by the DOE, and DOE has launched an Advanced Research Projects Agency-Energy (ARPA-E) program: the ARPA-E Methane Observation Networks with Innovative Technology to Obtain Reductions (MONITOR)

program. This program includes multiple research projects targeting development of monitoring envisioned by §95668(i). DOE notes that MONITOR projects are

...developing innovative technologies to cost-effectively and accurately locate and measure methane emissions associated with natural gas production. Such low-cost sensing systems are needed to reduce methane leaks anywhere from the wellpad to local distribution networks....⁶

This innovation is needed because:

Existing methane monitoring devices have limited ability to cost-effectively, consistently, and precisely locate and quantify the rate of the leak.⁷

The ARPA-E MONITOR program includes six projects that would provide methane monitoring systems with continuous or near-continuous capabilities for sensing leaks and characterizing leak rates. Another five projects are investigating technologies that are even earlier in development where it is premature to research an integrated, functional system. The program was launched in 2015, and projects will include a demonstration phase if earlier phases meet performance objectives. The demonstration testing would occur in the third year. This national R&D program will not conduct the demonstration phase for about two more years. In addition, there are no assurances of success. Some of the projects employ OGI approaches, but it does not appear that ultrasonic monitoring implied by the ARB analysis is being assessed.

The DOE program is indicative of the current state of the science, and shows that technology is not available to address the monitoring envisioned by §95668(i). Due to technological limitations, INGAA recommends eliminating §95668(i).

The Economic Analysis Should be Revised and Benefits Should Be Estimated

The ARB Economic Analysis (EA) should be revised to address errors, omissions and questionable assumptions. The analysis does not estimate environmental benefits, and that estimation should be completed to justify the requirements. As discussed further below, recently developed consensus standards provide an avenue to managing storage field operations.

Storage well monitoring costs are included in Appendix B to the Staff Report, Initial Statement of Reasons. Appendix B is the ARB Economic Analysis (EA), and Section L, “Monitoring Plan,” provides ARB estimates for the storage monitoring requirements. While ARB estimates benefits for other proposed standards, it does not estimate benefits from §95668(i). This oversight is significant because monitoring costs are substantial and have been under-estimated in the EA.

INGAA understands ARB’s interest in storage field well leaks and the underlying intent of the proposed monitoring, but INGAA does not believe that §95668(i) would result in significant benefits. Qualitative leak monitoring programs, including OGI and audio-visual-olfactory inspections, are sufficient to detect leaks in a timely manner without the excessively burdensome, uncertain, and costly criteria proposed in this rule. At most, the proposed storage

⁶ DOE ARPA-E website for MONITOR program, <http://arpa-e.energy.gov/?q=arpa-e-programs/monitor>.

⁷ *Id.*

OP-13-10
cont.

OP-13-11

OP-13-12

field Monitoring Plan may result in a brief reduction in the duration of a major incident leak and is unlikely to preclude such an incident.

The storage well monitoring costs in the EA include numerous errors, deficiencies, unsupported data, and inconsistencies. These flaws raise questions about the reliability of the cost-effectiveness analysis used to support the proposed storage facility monitoring requirements.

A detailed cost review of ARB's Economic Analysis (EA) is not provided here. But, INGAA is aware of a detailed review of ARB's estimated storage field monitoring costs prepared by Southern California Gas Company (SoCalGas) as a part of its comments to ARB. INGAA supports the methodology and general conclusions of the SoCalGas review.

The EA review completed by SoCalGas concludes that costs are under-estimated by a factor of 3 to 4.

The reasons that these costs have been under-estimated include:

- ARB reliance upon cost information from businesses that would profit from providing automated leak detection systems. No data or evidence is provided to document that systems have been successfully implemented for storage facility applications, and references for monitoring system costs were not provided.
- The EA includes *NO costs* for:
 - Operation and maintenance of automated wellhead monitoring systems;
 - Method 21 leak screening and subsequent leak repairs required by §95668(i)(4) and (5);
 - Contingencies for unproven technologies applications;
 - Data collection and alarm systems for notification of company and agency personnel;
 - Monitoring Plan preparation, and recordkeeping and reporting; and
 - Site and corporate support for survey teams (e.g., scheduling, leak repair).
- Based on experience with implementing OGI for more established handheld leak surveys, costs are under-estimated for:
 - Capital cost of ambient monitoring equipment (e.g., including the number of monitors because multiple monitors would be required);
 - O&M costs associated with the ambient monitoring equipment;
 - OGI unit costs and the number of cameras required for wellhead monitoring to ensure camera availability and continuous compliance with the rule; and
 - Scenarios that erroneously conclude well groupings that allow the monitoring of multiple wells with a single instrument.
- The cost estimate assumes the monitoring systems have a ten year lifetime, which is highly optimistic for sensitive instrumentation that has not been proven for continuous monitoring applications.

OP-13-12
cont.

In addition, CARB has not considered the environmental, landowner, and permitting impacts and associated costs of installing the ancillary infrastructure required to operate the proposed new monitoring technology. Storage wells traditionally have minimal power and communications infrastructure. Installation of overhead power/communications infrastructure to each facility and/or well to comply with §95668(i) represents a large amount of construction, including in previously undisturbed areas. The EA does not seem to recognize this; it appears wireless technology and/or underground burial is assumed. Additionally, “for purposes of the impact analysis, ARB assumes that compliance with the daily monitoring requirements will be achieved through installation of the grid detection system or through installation of wellhead sensors.” As discussed, commercial systems are not currently available to support this assumption.

OP-13-13

The EA severely underestimates the initial cost of ancillary infrastructure (e.g., power, control, communications, security) associated with adding monitoring equipment to often-remote locations. Storage wells traditionally have minimal power and communications infrastructure. Installation of overhead power/communications infrastructure to each facility and/or well to comply with §95668(i) represents a large amount of construction. The cost of this ancillary infrastructure will greatly surpass the \$84,630 estimated in Appendix B.

OP-13-14

The review showed that the EA includes other deficiencies and flaws, such as arithmetic calculation errors (e.g., three on page B-53 alone) and conflicting cost assumptions (e.g., capital cost of monitoring equipment per well is listed as \$54,000 in the text and \$90,000 in the equation on page B-52).

OP-13-15

In sum, the EA generally assumed that the monitoring equipment is purchased with no other transaction costs (i.e., installation, personnel training, troubleshooting, ongoing O&M). Collectively, these issues contribute to a significant under-estimate of costs. The SoCalGas review concluded that these costs are low and are off by a factor of 3 to 4. In addition to costs considered in the SoCalGas review, additional EA under-estimates are evident for power and communications infrastructure.

OP-13-16

If §95668(i) is Retained, Revisions are Warranted

If ARB elects to retain the proposed monitoring requirements, revisions are needed to address technical issues and implementation. As discussed above, there are technical challenges and cost implications associated with implementing the proposed rule monitoring provisions for underground storage facilities. If requirements are retained in the final rule, §95668(i) should be revised to attempt to mitigate technical issues and develop a functional monitoring program with feasible criteria.

a. Applicability of the three options in §95668(i)(1)(A) – (C)

OP-13-17

The applicability of the three “options” in §95668(i)(1)(A) – (C) should be clearly defined. Based on punctuation, (A) is a stand-alone sentence, and (B) and (C) are a list of two options. In addition, support documents imply that ARB anticipates item (A), plus (B) or (C) would be implemented. INGAA recommends requiring only one of the three options, as all of the options require extraordinary effort and, if functional, provide similar assurance. If technical challenges associated with continuous monitoring can be addressed, any of the three items would provide real time or daily data on site integrity and multiple requirements are not warranted.

By requiring compliance with one of three options, operators would be able to consider a near-term “manual” program based on item (B), while technology for continuous monitoring systems matures and becomes commercially available. Operators could later opt to migrate from a manual process to more automated approach as warranted by technological advances.

OP-13-17
cont.

b. Schedule, baseline determination, and phased implementation

Although INGAA recommends the removal of continuous monitoring requirements for reasons stated earlier in this document, we discuss some additional considerations if continuous monitoring is required (i.e., §95668(a)(1)(A) plus (B) or (C) is required). Additional time and effort will be needed to identify and validate technologies that meet the Proposed Rule criteria, while fulfilling operator expectations for performance and reliability. As discussed above, an extended implementation period will likely be necessary to develop a monitoring “baseline” that considers site-specific variability and uncertainty. Additional time may also be needed to allow continuous monitoring technologies to mature.

ARB should consider a staged implementation approach that includes a design and testing phase prior to requiring compliance with performance objectives. This is necessary because developing a “baseline” and measuring deviations from that baseline will be fraught with uncertainty. This would result in compliance uncertainty, which is untenable for operators. As discussed above, there are many unknowns in understanding a baseline and perceived deviations, so an extended schedule is warranted to gather information and “test” this process. After implementation, operators would report on lessons learned and requirements could be revisited. Based on insights gained as monitoring data is collected, a plan could be developed for full implementation of monitoring requirements with defined performance metrics (e.g., comparison versus baselines values).

OP-13-18

Without such an approach, continuous monitoring would surely face significant near-term technical challenges, and determining compliance could be complex. While INGAA supports transparency, prematurely implementing a monitoring approach would likely yield false positives and mis-inform the nearby community and public.

3. For natural gas transmission and storage (T&S), the leak detection and repair standards should be revised to minimize or avoid burdensome requirements, and eliminate punitive compliance criteria.

The Proposed Rule includes leak detection and repair (LDAR) requirements in §95669. The standards follow typical LDAR approaches in some cases, but also include requirements that introduce new compliance approaches and criteria, or include frequent inspections. INGAA offers comments on several issues:

- Compliance criteria that require a component population count should be eliminated. (This requirement was removed from the final NSPS Subpart OOOOa rule based on comments received from stakeholders.)
- Performance metrics based on the number or percentage of leaking components should be eliminated.
- Quarterly survey frequency is not warranted for natural gas T&S facilities.

OP-13-19

- For OGI surveys, “Level II Thermographer” training should not be required.
- The process of identifying “critical components” that can delay repair is overly complicated and should be eliminated.
- Additional time should be allowed for delaying repair of critical components, as long as the delay is justified.

OP-13-19
cont.

Component population counts should not be required.

The Proposed Rule introduces LDAR concepts that require “population counts” of components. Table 1 and Table 3 of the Proposed Rule establish leak definition concentration thresholds and an allowable number of leaks above those thresholds as a percentage of components inspected (or a defined number of leaks if less than 200 total components are surveyed). Thus, the regulatory criteria require completing component counts at affected facilities. Historically, the population of components (i.e., component counts) have been used with correlation equations or emission factors as a means to estimate emissions from equipment leaks. More recently, “leaker emission factors” have been developed to provide the ability to estimate equipment leak emissions based on the count of leaking components, rather than the total component count. This approach is used for natural gas T&S facilities that report under Subpart W of the GHGRP.

Component counts have not been integral to LDAR *performance* criteria and this concept is not substantiated. For its recent Subpart OOOOa rulemaking, EPA initially proposed to base survey frequency on the percentage of leaking components, which would have required component counts. Based on stakeholder comments, that approach was not retained in the final rule and component counts are not required. INGAA is not aware of any data that correlates meaningful emissions reductions based on the percentage of leaks found that exceed a particular Method 21 concentration screening measurement. The Method 21 measured concentration is a poor surrogate for actual leak *rates* (as documented in the literature⁸), but, lacking an economical alternative, has been used in LDAR programs. The proposed approach to assess a percentage of leaks above a particular screening concentration results in compounding technical inadequacies – i.e., component population is not necessarily indicative of leak emissions, nor is Method 21 concentration indicative of leak rate. For these reasons, INGAA recommends deleting criteria related to component population counts for natural gas T&S facilities.

OP-13-20

LDAR performance criteria based on a percentage of leaking components should be eliminated.

In addition, the aforementioned tables specify the *maximum* number of leaks allowed. As discussed above, population count criteria should not serve as the foundation of LDAR compliance. The objective of LDAR programs is to detect and repair leaks based on defined leak criteria (i.e., OGI screening, Method 21 screening). Adding punitive performance criteria that would result in non-compliance for actually finding and repairing leaks is not supportable.

OP-13-21

ARB has not provided any information that correlates LDAR activities or operator behavior with the prevalence of leaks, how leaks occur and grow over defined time periods, and how operator

OP-13-22

⁸ There are a number of examples in the literature, including: (1) Lott, R.A., T. Howard, and M. Web. 1996. *Estimating Fugitive Emissions: Problems and Solutions*. Presented at the Fugitive Emissions Symposium, Las Vegas, NV, August 15-16, 1996; (2) EPA Protocol for Leak Emission Estimates, EPA-453/R-95-017, November, 1995.

practices affect leak prevalence and size (with ARB assessing size based on a very imperfect Method 21 concentration threshold). Thus, the performance criteria in Tables 1 and 3 that limit the number of leaks above defined leak concentration thresholds is not warranted and unsubstantiated. INGAA strongly recommends eliminating the “allowable number of leaks” performance criteria in Tables 1 and 3 for natural gas T&S facilities.

OP-13-22
cont.

A quarterly survey frequency is not justified.

For natural gas T&S facilities, EPA documents, Subpart W data from compressor leak measurements, and other available material show that a small number of leaks contribute the vast majority of emissions. INGAA comments⁹ on the Subpart OOOOa proposed rule provide additional background, including details regarding unsupported EPA assumptions about the influence of survey frequency on LDAR performance. With a few leaks contributing to produce most emissions, the objective should be to identify and repair those leaks. That can be achieved with surveys and regular audio-visual (A-V) inspections that are conducted less frequently than quarterly.

OP-13-23

The Proposed Rule includes regulatory A-V inspections to detect leaks (e.g., daily at manned facilities), and as large leaks (that contribute the vast majority of emissions) develop, the leaks would very likely be discovered via A-V inspections. With no data to substantiate the incremental performance resulting from more frequent surveys, INGAA recommends an annual survey for T&S facilities, buttressed by the A-V inspection requirement.

Level II Thermographer training should not be required for OGI surveys.

The use of OGI was not included in earlier draft versions of the rule. The Proposed Rule includes OGI as an option, and §95669(g)(2) requires, “...a technician with minimum Level II Thermographer or equivalent training.” ARB did not provide a reason for this training or certification so this requirement should be eliminated.

The natural gas transmission and storage (T&S) industry has been a leader in implementing OGI for leak surveys, and supported early development of the FLIR technology (and others) through research funded by the Gas Research Institute (GRI) over 15 years ago. Thus, T&S operators are familiar with the technology and its application. In addition, operators have been using OGI for federal GHG Reporting Program surveys (i.e., Subpart W surveys) since 2011. This includes leak surveys conducted in-house, and hiring third party contractors to conduct OGI surveys.

OP-13-24

Standard operating practices are established for OGI instrumentation and EPA has included quality assurance requirement in the recent NSPS Subpart OOOOa. “Level II Thermographer” training is not an established qualification for leading practitioners of OGI leak surveys, and the proposed requirement adds an unnecessary expense and burden without a demonstrated value. In addition, CARB has not identified the criteria that would be used for thermographer qualification, or assessed the availability of qualified certification professionals or the associated certification costs. The requirement should be eliminated from §95669(g)(2).

⁹ EPA docket document number EPA-HQ-OAR-2010-0505-6872. INGAA Comments on EPA Proposed Subpart OOOOa Rule (Dec. 4, 2015).

The process to define “critical components” should be eliminated or streamlined.

It is imperative that LDAR implementation include the ability to delay repairs of natural gas T&S facilities if warranted. Existing federal and state regulations provide examples of Delay of Repair (DoR) provisions. The Proposed Rule includes a requirement to identify a list of “critical components” that are candidates for DoR if warranted, and requires Administrator approval of the critical components. Additional criteria, such as tagging critical components, are included in the rule. INGAA recommends deleting the critical component approach to DoR because it is cumbersome and adds unnecessary burden and bureaucracy. For example, a compressor and all associated piping that is imperative to gas delivery for a particular region would surely qualify as critical equipment. A literal reading of the rule would require approval for all of the related sub-components (connectors, valves, etc.) and tagging of these components. This would result in hundreds or thousands of tags at a typical compressor station, which could raise safety questions – e.g., the tags could hinder operator access for maintenance or other tasks.

OP-13-25

INGAA recommends an alternative approach to DoR based on other established LDAR regulations in Subpart VVa and NSPS Subpart OOOOa that require the operator to retain records documenting the DoR, but not seek approval as defined in the ARB rule. ARB or local air districts would have the ability to inspect records to ensure compliance. The rule should be revised to eliminate the “critical component” approach to DoR. Instead, the DoR approach should consider provisions such as delaying repairs that would require equipment or process blowdowns that would result in more emissions than the leak emissions until the next planned / scheduled shutdown. As discussed in the next comment regarding schedule, DoR should also include provisions modeled after the Colorado LDAR rule and include the following:

- If parts are unavailable, order parts promptly and complete repair within 15 working days of parts receipt (or the next planned / scheduled shutdown after the part is received if repair requires shutdown).
- If delay is attributable to another good cause, complete repair within 15 working days after the cause of delay ceases to exist. The operator must document the cause.

OP-13-26

These two items are important provisions that are relevant when unique circumstances arise that preclude the ability to complete repair within the maximum time allowed in the Proposed Rule.

CARB should correct the “Repair Time Period” in Table 2 and Table 4 to 12 months.

For LDAR, §95669(h)(3) and (i)(4) specify the maximum time allowed for repair of critical components, and up to 12 months is allowed. This is a revision from earlier versions of the Proposed Rule that indicated 180 days, and the longer timeframe is warranted. However, ARB omitted revisions to these criteria in Table 2 and Table 4. For the “Repair Time Period” indicated in Tables 2 and 4, the line item for critical components should be revised to: “Next shutdown or within ~~180 calendar days~~ **12 months.**”

OP-13-27

When delay of repair is allowed, the 12-month maximum delay is too restrictive for select scenarios.

Delay of repair provisions generally include the requirement to complete repairs as soon as practical, with operator obligation to document the situation. The Proposed Rule establishes a 12-month maximum, and there are occasional unique circumstances when that may not be possible for natural gas T&S facilities. For example, compressor stations typically include

OP-13-28

multiple compressors, and the compressors include “isolation valves” to segregate a unit from the process when not operating, or the valves required to isolate the station piping from the transmission pipeline. Those large valves are not “off the shelf” items and may include subcomponents / parts that require special machining or construction that are built when needed. The timing to order and obtain such parts, and then find an appropriate time to complete the repair (e.g., during a planned shutdown) without disrupting customer service may exceed 12 months. EPA acknowledged this in the recent Subpart OOOOa final rule by allowing up to two years to make repairs. Repairs should not be required within 12 months for these select scenarios. If this schedule limit is not revised in ARB’s final rule, there could be unintended consequences, such as:

- Requiring shutdown and blowdown of the equipment to complete the repair; blowdown emissions could exceed the emissions associated with the leak.
- Requiring shutdown of critical energy infrastructure if the equipment / part is not available within 12 months, or a planned shutdown does not occur within 12 months once the “delayed” part is received. This could affect natural gas system reliability – e.g., service disruptions during times of critical energy demand. Shutdown timing should preclude conflicts with a regulatory requirement to operate (e.g., Federal Energy Regulatory Commission).
- Necessitating that companies undertake extraordinary measures with inordinate costs to attempt to meet this requirement because 12 months is not sufficient time.

These circumstances will be rare, and the operator can document the basis for delays beyond 12 months. ARB should not include this limit in the rule because of potential detrimental outcomes.

4. For natural gas T&S facilities, applicability of separator and tank requirements should be clearly indicated and *Production wells and Underground Storage wells* should be Differentiated in the rule.

The Proposed Rule includes standards for separators and tanks in §95668(a) and standards for well-related operations in §95668(b), (g), and (h). These requirements appear to apply to upstream *production* operations and not to natural gas T&S operations, but that is not always evident. Therefore, ARB should clarify the applicability of requirements for the natural gas T&S segments. For §95668(a), it is fairly clear that natural gas T&S facilities are not subject, and the standard applies to production separators and tanks. For the three well-related standards, it is not immediately clear if the standard is referring solely to *production wells*, or if it also affects *underground storage wells*.

ARB should improve clarity by revising the rule to refer to the well type. For example, the definition of “Well” in §95667(a)(67) broadly includes production wells and underground storage wells, so additional review is needed to determine applicability or exclusions for storage wells. As explained below, §95668(b) and (g) standards do **not** apply to storage wells. But it appears that well casing vent measurement requirements in §95668(h) would apply to storage wells. The rule should be revised to more clearly indicate applicability and avoid confusion when the rule is implemented.

OP-13-28
cont.

OP-13-29

Separators and Tanks

The Proposed Rule includes standards for separator and tank systems in §95668(a). Natural gas T&S operations include tanks and separators, but emissions from this source type (i.e., from liquids flashing) are not an issue because natural gas is processed upstream of the T&S segments. Based on Proposed Rule definitions, §95668(a) does not apply to the natural gas T&S segment because of the following definition in §95667(a)(54):

(54) “Separator and tank system” means the first separator in a crude oil or natural gas production system and any tank or sump connected directly to the first separator.

OP-13-30

The definition refers to *production* and the first separator, or a tank or sump directly connected to that separator, so §95668(a) is not applicable to natural gas T&S facilities. As discussed below, applicability of other requirements related to production wells are not as clear as this situation, and INGAA recommends re-titling the sections to add clarity. In this case, §95668(a) would provide additional clarity if titled, “**Production** Separator and Tank Systems.”

§95668(b) – Circulation Tanks for Well Stimulation Treatments

For natural gas storage wells the applicability of §95668(b) is not immediately evident. INGAA concludes that this standard does not apply to storage wells based on the inter-related definitions and citations:

- “Well stimulation treatment” traditionally refers to processes to improve gas flow from *production* wells, and a definition is included in the rule at §95667(a)(65).

“Well stimulation treatment” means the treatment of a well designed to enhance crude oil and natural gas production or recovery by increasing the permeability of the formation and as further defined by the Division of Oil, Gas, and Geothermal Resources SB 4 Well Stimulation Treatment Regulations, Chapter 4, Subchapter 2, Article 2, section 1761(a) (December 30, 2014).

OP-13-31

The description clearly refers to natural gas *production* and not to storage wells. However, excluding natural gas storage wells based solely on the definition is not obvious. For example, the proposed definition does not clearly exclude storage well clean out and maintenance.

For clarity, this should be indicated in the rule by titling the section, “Circulation Tanks for **Production** Well Stimulation Treatments.” Alternatively, the definition at §95667(a)(65) could be revised to clearly indicate that natural gas storage wells are excluded.

§95668(g) – Liquids Unloading of Natural Gas Wells

Applicability of §95668(g) should also be clarified for natural gas storage wells. The rule text and definitions do not clearly indicate applicability, but ARB support documents indicate that §95668(g) applies to *production* wells. For example, the Draft Environmental Analysis describes the affected process as production wells:

OP-13-32

Over time, natural gas wells accumulate liquids that can impede and sometimes halt gas production. When the accumulation of liquid results in the slowing or cessation of gas production, removal of fluids (e.g., liquids unloading) is required in order to maintain production.

The description refers to gas *production* three times and storage wells are not mentioned. In addition, the ARB Initial Statement of Reasons document includes “plain English” background on oil and gas operations and processes in Section II.B. The background on Liquids Unloading in subsection (1)(b) describes a process for production wells; natural gas storage wells are not discussed.

OP-13-32
cont.

ARB should clearly indicate that §95668(g) is not applicable to storage wells. The rule could be revised to indicate §95668(g) applies to, “Liquids Unloading of Natural Gas **Production** Wells.” Alternatively, the definition of “liquids unloading” at §95667(a)(28) could be revised to clearly indicate that natural gas storage wells are excluded.

§95668(h) – Well Casing Vents

The applicability of the Rule to storage well casing vents is less clear than the other standards discussed above. The Proposed Rule requires operators of wells with a well casing vent open to the atmosphere to measure the natural gas flow rate from the well casing vent annually, retain records, and submit an annual report to ARB. There is not information available within the rule or background documents that clarify whether natural gas storage wells are excluded. Thus, it appears that §95668(h) applies to natural storage wells.

OP-13-33

Similar to the clarifications requested above, ARB should clarify the applicability of §95668(h). If §95668(h) does not apply to natural gas storage wells, this could be clarified by titling the section, “**Production** Well Casing Vents.” If this section applies to storage well casing vents, the rule should be revised to clearly indicate that this vent line is not included in the LDAR program for natural gas storage wells.



July 18, 2016

Electronic submittal: <http://www.arb.ca.gov/lispub/comm/bclist.php>

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Re: AGA's Comments on California ARB Proposed Regulation for Greenhouse Gas Emission Standards for Oil and Natural Gas Facilities

Clerk of the Board:

The American Gas Association (AGA) appreciates the opportunity to submit these comments on the California Air Resources Board (ARB) Proposed Regulation Order, "Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities released on May 31, 2016¹ (Proposed Rule). AGA has a direct interest in this Proposed Rule because it will directly impact several of our members that operate natural gas intrastate transmission and storage facilities located in California, and because history has demonstrated that California air rules such as this can serve as precedent influencing the contours of federal and state air regulations that directly impact *all* of our members.

The American Gas Association, founded in 1918, represents more than 200 local energy companies that deliver clean natural gas throughout the United States. There are more than 72 million residential, commercial and industrial natural gas customers in the U.S., of which 95 percent — just under 69 million customers — receive their gas from AGA members. AGA is an advocate for natural gas utility companies and their customers and provides a broad range of programs and services for member natural gas pipelines, marketers, gatherers, international natural gas companies and industry associates. Today, natural gas meets more than one-fourth of the United States' energy needs.

¹ Proposed Regulation Order, California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 10 Climate Change, Article 4, Subarticle 13: Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.

AGA members are committed to responsible environmental stewardship and greenhouse gas reduction. We have participated for over 20 years in the EPA’s voluntary Natural Gas STAR program to share technologies and innovations for reducing methane emissions and improving the environmental performance of natural gas systems.² AGA’s Board of Directors has adopted a Commitment to Enhancing Safety,³ and has approved voluntary AGA guidelines³ for reducing natural gas emissions.⁴ As a result of our members’ commitment to safety and efforts to modernize their distribution infrastructure, the recent updated EPA Inventory of Greenhouse Gas Emissions issued April 15, 2016 shows that emissions from natural gas distribution have dropped an impressive 74 percent since 1990, even as the industry added over 300,000 miles of distribution mains to serve 17 million more customers, an increase of 30 percent in both cases. AGA members also helped launch of EPA’s new voluntary Methane Challenge program in March 2016. All of the 41 companies that volunteered as Founding Partners are AGA members.⁵

AGA Supports INGAA’s Comments: We are concerned, however, that the Proposed Rule would impose unnecessary and costly burdens that would increase utility customer costs without improving environmental outcomes. Accordingly, for the reasons set forth by the Interstate Natural Gas Association of America (INGAA), AGA supports INGAA’s comments dated July 18, 2016 on the Proposed Rule.

OP-14-1

In particular, AGA agrees that:

1. The ARB should postpone this premature state action on underground storage pending the outcome of the ongoing incident investigation and federal rulemaking now required by Congress to establish minimum standards for underground storage, and in the interim we recommend the use of established consensus standards for pipeline safety that also minimize methane emissions.
2. Continuous ambient and wellhead monitoring for underground storage fields is not currently technically feasible and should not be required in the Proposed Rule;
3. The Proposed Rule should not impose unworkable leak detection and repair (LDAR) survey requirements that differ unreasonably from established regulatory approaches including and EPA’s recent New Source Performance Standards (NSPS) for new natural gas facilities under 40 C.F.R. Part 60, Subpart OOOOa; the Proposed Rule should (a)

OP-14-2

OP-14-3

OP-14-4

² Environmental Protection Agency, Natural Gas STAR Program, <http://www3.epa.gov/gasstar/basic-information/index.html#overview1>.

³ Natural Gas Utilities Renew Commitment to Enhancing Safety, October 2015, <https://www.aga.org/news/news-releases/natural-gas-utilities-renew-commitment-enhancing-safety> .

⁴ AGA Guidelines for Reducing Natural Gas Emissions from Distribution Systems, May 17, 2014: https://www.aga.org/sites/default/files/aga_guidelines_for_natural_gas_emission_reduction_bd_approved_may_17_2014.pdf.

⁵ See EPA Methane Challenge web site, <https://www3.epa.gov/gasstar/methanechallenge/>.

eliminate performance criteria that limit the number of leaks based on component counts; (b) revise unnecessary and unworkable requirements related to survey frequency and operator training; and (c) revise delay of repair (DoR) provisions; and

OP-14-4
cont.

4. The ARB should clarify that it is exempting natural gas transmission and storage facilities from upstream storage tank and production well requirements.

OP-14-5

AGA and member technical experts worked with INGAA and the American Petroleum Institute (API) over a nearly four year process to develop two recommended practices (RP) for natural gas underground storage that were accredited by the American National Standards Institute (ANSI) and issued in September 2015. These two sets of ANSI-accredited recommended practices address underground natural gas storage in depleted hydrocarbon reservoirs (API RP 1171) and salt caverns (API RP 1170). In recent legislation reauthorizing the federal Pipeline Safety Act, known as “Protecting our Infrastructure of Pipelines and Enhancing Safety Act (PIPES Act),⁶ Congress required that within two years of enactment, the U.S. Department of Transportation (DOT) “shall issue minimum safety standards for underground natural gas storage facilities” considering costs to consumers and “consensus standards for the operation, environmental protection, integrity management of underground natural gas storage facilities” (such as RP 1170 and 1171), and the recommendations of the task force set up by the PIPES Act. 49 U.S.C. §60141. We believe the public interest would be better served if ARB were to defer this premature state action pending the development of balanced federal standards incorporating these ANSI accredited standards.

OP-14-6

Please contact me if you should have any questions. Again, AGA appreciates the opportunity to comment on the Proposed Rule.

Respectfully Submitted,



Pamela Lacey
Chief Regulatory Counsel
American Gas Association
400 N. Capitol St., NW
Washington, DC 20001
202-824-7340
placey@aga.org

⁶ Protecting our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2016, Pub. L. No. 114-183 (June 22, 2016)

July 18, 2016

OG-OP-15-EJ

California Air Resources Board

1001 I Street

Sacramento, CA 95814

Via Electronic Submittal:

http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=oilandgas2016&comm_period=A

Re: Comments urging strengthening of CARB's Proposed Regulation on Oil & Natural Gas Production, Processing, and Storage

The undersigned environmental health and justice organizations offer comments on the proposed Oil and Natural Gas Production Processing, and Storage (the "Oil & Gas rule") regulation. We appreciate efforts of the California Air Resources Board (CARB) in developing the regulation, and urge the strengthening measures below, to prevent practices leaving communities unprotected.

OP-15-1

Our organizations work for Environmental Justice in low-income communities and communities of color heavily impacted by air quality and related public health issues throughout California. We actively participate in local and statewide efforts to prevent and minimize the widespread harms of oil and gas extraction, processing, and storage. Our communities are hard hit by local health impacts of these sources, and are also among the most vulnerable to climate impacts such as heat waves, drought, and increasing smog due to temperature increases. The proposed rule focuses on reduction of the greenhouse gas (GHG) methane, but also identifies sorely needed benefits due to cuts in smog precursor and toxic co-pollutants, since multiple pollutants are emitted simultaneously by these industries. Co-pollutants include toxic BTEX compounds (Benzene, Toluene, Ethylbenzene, and Xylene), other VOCs, hydrogen sulfide, and other pollutants that burden our communities.

The extraction industry has long enjoyed lax or non-existent regulation and primitive control systems as compared to industries such as refining. In many cases, facilities are inherently badly sited, should never have been permitted for operation in residential neighborhoods, and receive many public complaints of severe odors and oil eruptions. Methane can also be emitted during these odor "episodes" reported by communities, so cleaning up odors can also clean up GHGs.

Both ongoing and episodic emissions have been poorly quantified and rarely monitored. With "enhanced" drilling to stimulate wells, many of our communities have seen a boom in extraction operations, sometimes within a few feet of their houses. Facilities all but shut down have drastically expanded operation in recent years, and new operations are springing up regularly all over the state. The volume of oil and gas produced is not necessarily a good indicator of emissions and impacts to local communities, which can be heavily impacted even by a small

nearby facility. For all these reasons and to maximize GHGs and co-pollutant cuts, it is essential that at a minimum, CARB require this industry catch up with best practices and technologies for emission prevention required in other heavy industries such as oil refining. While oil refining pollution prevention is far from ideal, extraction-related industries should at least meet the best standards that have been established by air districts for oil refining, which processes the same chemicals.

I. We urge tighter leak standards, consistent with best oil refinery standards, and speeding up implementation

We urge that leak standards in the regulation be tightened to 100 ppm for valves and connectors, 500 ppm for pumps, compressors, and pressure relief devices, and 100 ppm for any other leaking components (including pneumatic devices), to be minimized in 24 hours and repaired within 7 days. This standard has been required by the Bay Area Air Quality Management District (BAAQMD) for oil refineries for decades. Leaks above these levels should be considered a violation, and inspection and enforcement mechanisms should set in place.

OP-15-2

We see no reason for treating oil and gas extraction and handling these leak standards differently from oil refining operations, since they process exactly the same chemicals, and since oil and gas handling operations are much less complex than oil refineries, and in many cases can more easily meet the standards. It is well-established that equipment is available for meeting these leak standards for the pollutants involved. Oil refineries within the BAAQMD District must meet these leak standards for many thousands of valves, connectors, and seals. Thus the Oil & Gas extraction and handling industry, which uses far fewer fugitive leak components, should readily be able to meet the standards. By adopting tighter standards for both methane and co-pollutants, CARB will set strong, consistent statewide requirements for GHGs, criteria pollutants, and toxics.

OP-15-3

The final leak standards proposed by CARB are as follows (interim standards are even weaker):

Table 10: Repair Time Periods on or after January 1, 2020

Leak Threshold	Repair Time Period
1,000-9,999 ppmv	14 calendar days
10,000-49,999 ppmv	5 calendar days
50,000 ppmv or greater	2 calendar days
Critical Components	Next shutdown or within 12 months

In the Staff Report for the Oil & Gas rule, staff explains the justification for the standards proposed to be based on the most common standards in the state:¹

In the proposed regulation, 1,000 ppmv is the lowest leak threshold defined. Staff chose this threshold to be consistent with the majority of districts with oil and gas LDAR regulations. District regulations vary on the threshold but 1,000 ppmv is the most common across the districts. In addition, staff chose to lower the threshold from 10,000 ppmv after two years to 1,000 ppmv simply to ensure that more leaks are being detected. The thresholds and repair times assure that leaks are repaired once found and that the largest emitting sources are prioritized. The quickest leak repair time period is 2 calendar days for leaks measuring 50,000 ppmv or greater.

OP-15-4

While we appreciate tightening from the earlier-proposed 10,000 ppm standard, we do not believe that choosing the standard based on the largest number of Districts is a valid justification. Many of these standards were adopted long ago, and should have been upgraded to meet the best standards in the state. Many of these Districts are smaller, so simply counting them doesn't provide an indicator of their relevance to impacts. **Setting a state-wide standard that meets best practices will ensure that the new rule doesn't follow an arbitrary average, but instead leads the state as a whole forward toward consistent best practices, proven to be readily-available.**

We propose that the leak standard in the proposed Oil & Gas rule be replaced with the following sections from BAAQMD Regulation 8, Rule 18, requiring a leak standard of 100 ppm for valves, and connectors, a 500 ppm standard for pumps, compressors, and pressure relief devices, and 100 ppm for all other devices (including pneumatic devices):²

8-18-301 General: Except for valves, pumps and compressors, connections and pressure relief devices subject to the requirements of Sections 8-18-302, 303, 304, 305 and Bay Area Air Quality Management District December 16, 2015 8-18-6 306, **a person shall not use any equipment that leaks total organic compounds in excess of 100 ppm unless the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days.**

OP-15-5

8-18-302 Valves: Except as provided in Section 8-18-306, a person shall not use any valve that leaks total organic compounds in excess of 100 ppm unless one of the following conditions is met: 302.1 If the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days; or 302.2 If the leak has been discovered by the APCO, the leak must be repaired within 24 hours.

8-18-303 Pumps and Compressors: Except as provided in Section 8-18-306, a person shall not use any pump or compressor that leaks total organic compounds in excess

¹ *Staff Report: Initial Statement of Reasons*, (Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude oil and Natural Gas Facilities), Released: May 31, 2016, Scheduled for Consideration: July 21, 2016, at p. 119, available at: <http://www.arb.ca.gov/cc/oil-gas/isor.htm>

² Available at: <http://www.baaqmd.gov/~media/files/planning-and-research/rules-and-regs/reg-08/rg0818.pdf?la=en>

of 500 ppm unless one of the following conditions is met: 303.1 If the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days; or 303.2 If the leak has been discovered by the APCO, the leak must be repaired within 24 hours.

8-18-304 Connections: Except as provided in Section 8-18-306, a person shall not use any connection that leaks total organic compounds in excess of 100 ppm unless one of the following conditions is met: 304.1 If the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days; or 304.2 If the leak has been discovered by the APCO, the leak must be repaired within 24 hours.

8-18-305 Pressure Relief Devices: Except as provided in Section 8-18-306, a person shall not use any pressure relief device that leaks total organic compounds in excess of 500 ppm unless the leak has been discovered by the operator, minimized within 24 hours and repaired within 15 days; or if the leak has been discovered by the APCO, minimized within 24 hours and repaired within 7 days.

OP-15-5
cont.

II. **Deadlines, exemption allowances, monitoring, and enforcement requirements should be tightened**

Again, in an effort to ensure that long-overdue available best practice methods be expeditiously set for all oil & gas extraction, processing, and storage operations, we urge the additional improvements to the regulation:

- **All standards should be met within at longest two years of adoption, rather than post-2020 for final regulation requirements.** Waiting until 2020 to implement the final standards is excessive – facilities which have been leaking and emitting for far too long need to clean up expeditiously to protect public health and the environment, and should be able to meet standards within two years of adoption. If facilities are not leaking or significantly emitting, it should be no problem to meet standards expeditiously.
- **Monitoring step-down to annual inspections should not be allowed, but should continue at least quarterly.** Monitoring practices are an essential part of pollution prevention. Monthly inspections could further increase reductions achieved, but at least quarterly inspections should be required for all components. Continuous monitoring options should be considered. No option to move to annual inspections should be allowed, even if no leaks are detected. This is especially important for the oil & gas production, processing, and storage industry which has previously lacked inspection. Regular inspection should be a basic part of normal business practices.
- **An exemption allowing 12-month leakage for “critical” components is extremely excessive and should be removed, as oil and gas extraction and processing operations can shut down operations much more easily than oil refineries.** The concept of allowing longer leakage for critical or inaccessible components came out of

OP-15-6

OP-15-7

OP-15-8

oil refining regulation. Oil refineries are vastly more complex, and require complicated shutdown procedures. Oil extraction and processing operations are far smaller and less complex, and handle much lower volumes of materials. They can shut down and start up quickly, without the major impacts caused by oil refinery shutdowns. A year-long allowance for so-called “critical” component leakage is extreme, and encourages unnecessary poor practices and chronic health-threatening emissions exposures.

OP-15-8
cont.

- **The strongest independent Monitoring, Inspection and Enforcement mechanisms should be in place through regulators.** Any leaks or emissions above standards should be defined as a violation of rules, with associated penalties sufficiently harsh to discourage lax operations.

OP-15-9

- **Control efficiency at 95% is lower than achievable standards above 99% for vapor recovery.** CARB is well aware of much higher control efficiencies for handling hydrocarbon and sulfur gases. We strongly encourage adoption of best available vapor capture and control, and discourage combustion devices such as flares, especially near communities.

OP-15-10

- **Exemptions should generally be removed for lower volume operations, or where lower pollutant concentration are assumed, at least while California gains more site-specific long-term data on this poorly-monitored industry.** Individual operations assumed to have lower emissions as indicated by industry-wide average factors (especially since these factors have been widely questioned in the scientific literature), and that are not monitored onsite, may never be accurately assessed. Smaller operations are not necessarily lower-emitters, and can be especially harmful in close proximity to neighbors. CARB has acknowledged in its staff report that atmospheric monitoring of oil and gas operations have found higher emissions than EPA bottom-up emissions factor assumptions. Given ongoing community complaints about this industry, the proposed Oil & Gas rule could provide a major opportunity to evaluate actual local monitored impacts of all equipment used in all such operations. These operations are not benign, are inherently polluting, and should at minimum meet best practice leak and vapor recovery standards for all equipment.

OP-15-11

- **At a minimum, any facility within 1500 feet of a residence should be required to meet tight leak and vapor capture standards, regardless of minimum volume or pollutant concentration thresholds.** It would further be prudent to prohibit such operations near residents, especially since horizontal drilling techniques allow remote access to wells.

OP-15-12

- **We request that CARB release an annual report to the legislature with aggregate emissions data from owners and operators collected under this rule and data from CalEnviroScreen,** for the purposes of prioritizing inspection and enforcement of this rule in areas most overburdened by pollution. We request that CARB make this document available to the public in electronic format. *See e.g.* Cal. Health and Safety Code Sec. § 25180.2.

OP-15-13

Thank you for your consideration, and for your work developing these regulations.

Sincerely,

Julia May, Senior Scientist, **CBE** (Communities for a Better Environment)

Amy Vanderwarker, Co-Director, **CEJA** (California Environmental Justice Alliance)

Taylor Thomas, Research and Policy Analyst,
East Yard Communities for Environmental Justice

Madeline Stano, Staff Attorney, **CRPE** (Center on Race Poverty, & the Environment)

Michele Hasson, MPP, Policy Advocate/Specialist. **CCAEEJ** (Center for Community Action & Environmental Justice)

Jack Eidt, Steering Committee, **SoCal 350 Climate Action**

Joe Galliani, Founder and Co-Organizer, and
Sherry Lear, Co-Organizer **South Bay Los Angeles 350 Climate Action Group**

Anabell Chavez, Advisory Board Member, **Wilmington Improvement Network**

Jesse N. Marquez, Executive Director, **CFASE** (Coalition for a Safe Environment)

Drew Wood, Executive Director, **California Kids IAQ**, Wilmington

Ricardo Pulido, Executive Director, **Community Dreams**, Wilmington

Pastor Alfred Carrillo, **Apostolic Faith Center**, Wilmington

Chaplin Anthony Quezada, **American Veterans (AMVETS)**, Long Beach

Magali Sanchez-Hall, MPH, Executive Director, **EMERGE**, Wilmington

Veronica Padilla, Executive Director, **Pacoima Beautiful**

Nancy Halpern Ibrahim, MPH, Executive Director, **Esperanza Community Housing Corporation**

Martha Dina Argüello, Executive Director, **PSR-LA** (Physicians for Social Responsibility - Los Angeles)



CENTER for BIOLOGICAL DIVERSITY

Because life is good.

July 18, 2016

Via Internet Upload at <http://www.arb.ca.gov/lispub/comm/bclist.php>, oilandgas2016

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

To the California Air Resources Board and Staff:

The Center for Biological Diversity submits the following comments on the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, and the accompanying the Initial Statement of Reasons (“ISOR”) and Draft Environmental Analysis (“Draft EA”) prepared by the California Air Resources Board (“ARB”).

The Center is a non-profit organization with more than one million members and online activists and offices throughout the United States, including in Oakland, Los Angeles, Sacramento, and Joshua Tree, California. The Center’s mission is to ensure the preservation, protection and restoration of biodiversity, native species, ecosystems, public lands and waters and public health. In furtherance of these goals, the Center’s Climate Law Institute seeks to reduce U.S. greenhouse gas emissions and other air pollution to protect biological diversity, the environment, and human health and welfare. Specific objectives include securing protections for species threatened by global warming, ensuring compliance with applicable law in order to reduce greenhouse gas emissions and other air pollution, and educating and mobilizing the public on global warming and air quality issues.

The Center supports many elements of the proposed regulation, and these comments offer specific recommendations intended to strengthen its goals and enhance its effectiveness.

I. The Regulation Should Eliminate Methane Emissions from the Oil and Gas Sector Entirely, and on the Shortest Possible Timeline

The Center has long supported taking action to address methane emissions from the oil and gas sector. In fact, Californians have been waiting too long for this. Both the 2008 Climate Change Scoping Plan and the subsequent First Update to the Climate Change Scoping Plan identified the regulation of oil and gas operations as an important greenhouse gas (“GHG”)

OP-16-1

mitigation measure. Furthermore, the currently proposed regulation was developed largely based upon data that were collected in 2009.

Methane is a substantial component of anthropogenic greenhouse gas emissions, responsible for as much as a quarter of climate forcing, and methane emissions from the oil and gas industry are responsible for approximately 15 percent of methane emissions in the state. Furthermore, methane emissions from the oil and gas sector are strongly associated with co-pollutants that are known health threats, and many of these emissions are located in close proximity to communities already suffering from poor air quality and associated health impacts.

The staff report points to the recently proposed Short-Lived Climate Pollutant strategy that includes a 40 percent reduction of methane by 2030 with a 40-45 percent reduction from the oil and gas sector as a whole by 2025. The Center agrees with the need for this action, but the goal should be for much greater reductions and on a shorter timeline, and there are numerous ways that the Proposed Regulation could be strengthened to achieve greater reductions.

In many ways methane from the oil and gas sector is among the most ripe and obvious targets for reductions, as the emissions are unintended, accidental, and unnecessary for the underlying activities. The Center strongly supports the goal of achieving substantial reductions in fugitive methane emissions from the oil and gas industry, and urges ARB to consider all options to eliminate methane emissions from the oil and gas sector entirely. The following are specific provisions in the Proposed Regulation that must be strengthened to increase the effectiveness of the

OP-16-1
cont.

A. Implementation Starting in 2017

Compared with the discussion proposal, the implementation start date for the regulation was pushed back a year, from January 2017 to January 2018. There is no need for this delay, and no reason to allow uncontrolled emissions from the oil and gas industry for any additional time, especially when many of those emissions can be easily reduced through repairs.

OP-16-2

B. Quarterly Leak Detection and Repair

The proposed rule requires quarterly LDAR monitoring of facilities initially, but allows facilities to downgrade to annual monitoring if no leaks are found in five consecutive quarters.¹ Not only does this mean that some leaks may occur for up to a year before being detected, but it also creates a perverse incentive for operators to act less effectively to find and report leaks. To maximize compliance and minimize fugitive emissions, LDAR must be required quarterly.

OP-16-3

¹ § 95669.(g)(1): “The quarterly inspection frequency may be reduced to annually provided that the following conditions are met: (A) All components have been measured for five (5) consecutive calendar quarters and the number of leaks has been determined to be below the number of allowable leaks for each leak threshold category...” Proposed Regulation at 22.

C. Critical Components

The proposed regulation includes special allowances for methane leaks from sources identified as critical components.² These special allowances would allow such leaks to continue for up to a year if the repair requires shutting down the operation.³ While it may make sense not to require the removal of a component for which there is no replacement or possibility of bypass, this option should apply only in those cases where shutdown of the particular operation as a whole would not curtail the leak.

OP-16-4

D. Low-Bleed Pneumatics and Heavy Crude Components

The testing of low-bleed pneumatics is required only annually, and heavy crude components are exempt from leak detection and repair requirements entirely because they “emit less total hydrocarbons, and therefore less methane, than other components found in gas or other liquid service.”⁴ The fact that high-bleed devices generally emit even higher volumes than low-bleed devices is no reason to allow for continued methane emissions from low bleed devices. Low-bleed pneumatics are also exempt from the requirement to be replaced with no-bleed devices. Staff Report at 101. The staff report explains that this allowance is offered in large part because those components were recently replaced in response to recent rule changes. Again, this is no reason to allow for continued methane emissions from low bleed devices.

OP-16-5

E. Flaring

While the Proposed Regulation creates a hierarchy that prioritizes gas collection and use over combustion, the potential for increased incidence of flaring should be addressed. Specifically, ARB could set a hard limit on flaring allowed at each type of operation to require collection and use at the larger sources.

OP-16-6

II. The Current Requirements for Underground Storage Facilities Must Be Strengthened to Avoid Catastrophic Leaks Not Covered in the Proposed Regulation

The Proposed Regulation at section 95668(i) requires monitoring combined with leak detection and repair at underground storage facilities, but these measures alone will not prevent future disasters like that at Aliso Canyon. By the time that increased ambient methane

OP-16-7

² “ ‘Critical component’ means any component that would require the shutdown of a critical process unit if that component was shutdown or disabled.” “ ‘Critical process unit’ means a process unit that must remain in service because of its importance to the overall process that requires it to continue to operate, and has no equivalent equipment to replace it or cannot be bypassed, and it is technically infeasible to repair leaks from that process unit without shutting it down and opening the process unit to the atmosphere.” Proposed regulation at 3.

³ “Critical components are allowed additional time to make repairs, but must be repaired during the next process unit shutdown or within 12 months from the date of the initial leak concentration measurement, whichever is sooner.” 95668(d)(3)(F). Regulation at 46.

⁴ Section 95669(b)(2)

concentrations are detected, it may be too late to avoid disaster. The largest danger is wells with a single barrier without surrounding cement. Thus, the Proposed Regulation should first identify all single-barrier storage operations. These must be inspected for evidence of corrosion, cracking, or other loss of casing strength. If such evidence is found, the well must be taken out of operation immediately. Furthermore, all storage facilities should be required to have downhole shutoff valves, something that Aliso Canyon storage well SS25 lacked. The presence of a downhole shutoff valve could have avoided the massive leakage at Aliso Canyon and must be required of all storage wells going forward.

OP-16-7
cont.

III. The Proposed Regulation Must be Expanded to Address Fugitive Emissions from Abandoned Wells

Although the ISOR mentions that “abandoned or idle wells may be located at facilities that were previous oil or natural gas production fields,” no further attempt is made to address these emissions. It is clear that abandoned oil and gas wells can be a significant source of methane emissions, yet current GHG inventories omit this source. One recent study measured methane emission rates from abandoned wells in Pennsylvania and estimated that the emissions accounted for 4 to 7 percent of the state’s total methane emissions.⁵ In California, approximately 45 percent of wells in DOGGR’s database are classified as “plugged and abandoned,”⁶ raising the distinct possibility that these wells are emitting substantial volumes of methane. These sources must be addressed under the Regulation to achieve the level of reductions necessary to avoid catastrophic climate change.

OP-16-8

IV. Leak Detection Devices Must Be Carefully Tested and Calibrated

The requirements of the Proposed Regulation depend on accurate methane measurements; acceptable devices must be thoroughly screened. Recent data suggest that at least one commonly used methane sensor is prone to failures that result in underestimation of methane emissions.⁷ ARB should revise the Regulation to ensure that known problematic devices are disallowed and furthermore require evidence that any device used to detect leaks is operating accurately with proper protocol followed to maintain calibration.

OP-16-9

⁵ Mary Kang et al., *Direct measurements of methane emissions from abandoned oil and gas wells in Pennsylvania*, 111 PNAS 18173 (2014), available at <http://www.pnas.org/content/111/51/18173.full.pdf>.

⁶ Presentation by Mary Kang to California Energy Commission (Nov. 10, 2015), available at http://www.energy.ca.gov/research/notices/2015-11-10_workshop/presentations/05_Stanford_University_M_Kang.pdf.

⁷ Touché Howard, *University of Texas study underestimates national methane emissions at natural gas production sites due to instrument sensor failure*, 3 ENERGY SCIENCE & ENGINEERING 443 (2015), available at <http://onlinelibrary.wiley.com/doi/10.1002/ese3.81/epdf>.

V. The Regulation is Needed to Fill Critical Gaps in the Current Regulation of Emissions From the Oil and Gas Sector

Although other aspects of the oil and gas sector are subject to a regulation, ARB's Proposed Regulation would be the only state-wide limit on methane from existing oil and gas sources. The federal EPA rules requiring oil and gas operators to check well site facilities for methane leaks on a semi-annual basis and compressor stations on a quarterly basis apply only to new or modified facilities. For these reasons, the proposed regulation is sorely needed to fill critical gaps in the current regulation of emissions from the oil and gas sector. Furthermore, existing regulations of well stimulation do not address methane emissions specifically from these operations, nor do they affect other aspects of oil and gas extraction that are significant sources of fugitive methane.

OP-16-10

ARB appears to be interpreting SB 1371 as preemptive of its role in regulating methane emissions from natural gas pipelines.⁸ However, the fact that the CPUC is developing regulations as mandated by SB 1371 does not mean that ARB cannot or should not develop emissions requirements for those sources.⁹ Nothing in SB 1371 indicates that pipeline emissions cannot also be addressed through regulations developed at ARB to address GHG emissions from the oil and gas sector.

OP-16-11

Finally, we note that ARB has indicated the importance of reducing methane from the oil and gas sector as a part of its Strategy to Reduce Short-Lived Climate Pollutants. This is critical not only to achieving the climate goals of the state but to ensuring that our current fuel and supply does not result in unaccounted and unregulated methane leakage. First, as ARB concludes in the Strategy (at 77), meaningful reductions in methane from the oil and gas sector will ultimately depend upon reducing demand does not mean that methane emissions can be permissible in the meantime. To cap this methane source and to begin to move oil and gas toward a standard that allows for meaningful comparison to clean energy sources, fugitive methane should be capped at effectively zero by 2020. Furthermore, it essential that ARB

OP-16-12

⁸ "Accordingly, this regulation covers upstream emissions (production, gathering and boosting stations, and processing) as well as natural gas storage and transmission compressor stations (collectively "oil and gas"). This regulation does not cover the petroleum refining sector. Further, GHG emissions from oil and gas pipelines and related facilities are being addressed in a separate regulatory effort in partnership with the California Public Utilities Commission (CPUC)." Staff Report at 1.

⁹ The Legislative Counsel's Digest to SB 1371, the 2014 legislation mandating that PUC develop regulations to minimize leaks from natural gas pipelines, describes that bill this way: "[SB 1371] would require the commission, giving priority to safety, reliability, and affordability of service, to adopt rules and procedures governing the operation, maintenance, repair, and replacement of those commission-regulated gas pipeline facilities that are intrastate transmission and distribution lines to minimize leaks as a hazard to be mitigated pursuant to the Natural Gas Pipeline Safety Act of 2011, consistent with specified federal regulations, and a specified order of the commission, and to reduce emissions of natural gas from those facilities to the maximum extent feasible in order to advance the state's goals in reducing emissions of greenhouse gases pursuant to the California Global Warming Solutions Act of 2006."

continue its efforts (Strategy at 79) to ascertain true levels of methane leakage from the oil and gas industry such that all fugitive emissions are effectively addressed.

OP-16-12
cont.

VI. The Global Warming Potential for Methane Must Reflect the Latest Science

The Center strongly supports ARB's use of a 20-year global warming potential ("GWP") for methane. The time horizon used to equate methane and CO₂ emissions has significant implications for policy decisions in which the time horizon of the GWP critically influences the cost-benefit analysis of mitigation options. However, the Draft EA and Economic Analysis employ an outdated value for the 20-year GWP of methane, based on the IPCC's Fourth Assessment Report. Staff Report at 29, Economic Analysis at B-3.

We strongly urge ARB to use GWP values from the most recent IPCC Fifth Assessment Report ("AR5"), as it does for black carbon. The outdated 20-year GWP of 72 omits critical carbon cycle feedbacks. This must be corrected: carbon cycle feedbacks must be included to properly equate methane and CO₂ warming influences. The groundbreaking realization by the contributors to AR5 was that carbon cycle feedbacks are an inherent part of the warming caused by CO₂. Yet, until the most recent Assessment, they were omitted from GWP values for non-CO₂ greenhouse gases. As a result, until AR5, the GWP conversion was actually comparing apples to oranges. The only way to accurately compare among greenhouse gases—the entire purpose of a GWP—is to include carbon cycle feedbacks. According to the AR5, this results in a 100-year methane GWP of 36 and a 20-year GWP of 87.¹⁰

OP-16-13

VII. The Draft EA Does Not Meet CEQA Requirements

The Draft EA fails to adequately analyze the project under CEQA for several reasons. First, the GHG analysis does not provide data on current and future oil and gas greenhouse gas emissions as context for the expected reductions from this regulation. Second, the alternatives analysis omits any alternatives that would provide greater environmental benefit in the form of deeper emissions cuts. We also note that while ARB considers this a programmatic environmental analysis (Draft EA at 7), this designation in no way excuses faulty or imprecise analysis where data are available. *Citizens for a Sustainable Treasure Island v. City and County of San Francisco*, 227 Cal. App. 4th 1036, 1052 (Cal. App. 2014). Finally, this Draft EA is prepared for a certified regulatory program. Draft EA at 6. This does not mean, however, that the analysis may short circuit the requirements for a thorough and meaningful analysis under CEQA. *Mountain Lion Foundation v. Fish & Game Com.*, 16 Cal. 4th 105, 115 (1997); *Conway v. State Water Resources Control Bd.*, 235 Cal. App. 4th 671, 680 (2015).

OP-16-14

A. The GHG Impacts Analysis Fails to Place Emission Reductions in Context

¹⁰ G. Myhre et al., *Anthropogenic and Natural Radiative Forcing*, in CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE IPCC Table 8.7 at 714 (Cambridge Univ. Press 2013).

The Draft EA reports total GHG emission reductions at Table 4-4, but fails to show how these reductions compare with statewide oil and gas climate pollutants. An adequate description of a project’s baseline, or environmental setting, is essential to allow decisionmakers to fully evaluate the impacts of a project. See CEQA Guidelines § 15125(a), (c). Furthermore, any specific information that would be necessary to evaluate impacts must be included in an environmental analysis document. See *Cadiz Land Co. v Rail Cycle*, 83 Cal. App. 4th 74, 93-94 (2000). Here, a critical component of the environmental setting for GHG impacts is the baseline emissions from the oil and gas industry as a whole, and from the various categories identified for reduction. The Draft EA must provide a direct comparison between baseline emission levels and targeted reductions in its section on GHG impacts.

OP-16-15

Not only are current emissions levels essential, but also estimated future emissions must be disclosed. The Draft EA alludes to a historical decline in GHG emissions from the oil and gas sector (Draft EA at 11), but other data suggest that this trend may change in the future. First, it is well-established that the oil market is highly volatile, making historic trends questionable predictors. Second, Kern County recently issued an environmental impact report (“EIR”) for its ordinance creating a ministerial process for oil and gas permitting in the County. The EIR indicated that there would be approximately 2,697 new producing wells per year in Kern County for the next 20 years and beyond.¹¹ These data strongly contradict the general evidence provided by the applicant of decreasing oil and gas production. Finally, a recent analysis of well stimulation by the California Council on Science and Technology found that well stimulation may result in expanded oil production in California, especially from the Monterey Formation.¹² Without an estimate of future potential emission trends, it is impossible for decisionmakers to evaluate how this rule may aid efforts to avoid future climate change.

OP-16-16

Even though the rule will result in net GHG emission reductions, the public and decisionmakers have been denied the opportunity to assess the significance of those reductions as well as the relative impact of the increases in CO₂ emissions that will result from increased flaring as a result of compliance actions.

OP-16-17

B. The Draft EA Fails to Consider Alternatives to Achieve Greater Reductions

The Draft EA considers only three alternatives, none of which represent increased emission reductions over the proposed rule. In so doing, the alternatives analysis denies the public and decisionmakers the opportunity to assess all reasonable options to reduce environmental impacts of the project. The range of alternatives should “include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. CEQA Guidelines 15126.6(c). The Draft EA

OP-16-18

¹¹ Kern County, Environmental Impact Report: Revisions to Kern County Zoning Ordinance – 2015(c) at 3-30 (July 2015), available at <http://pcd.kerndsa.com/planning/environmental-documents/421-oil-gas-deir>.

¹² California Council on Science and Technology, AN INDEPENDENT ASSESSMENT OF WELL STIMULATION IN CALIFORNIA: WELL STIMULATION TECHNOLOGIES AND THEIR PAST, PRESENT AND POTENTIAL FUTURE USE IN CALIFORNIA (Jan. 2015), available at <http://ccst.us/publications/2015/2015SB4-v1.pdf>.

considers only three alternatives in addition to the proposed regulation: 1) No Project, 2) No Enhanced Monitoring; and 3) No Vapor Collection. Draft EA at 112. These three alternatives would achieve the same or fewer reductions. Greater climate benefits would be achieved with standards that require greater reductions, yet no such alternative was considered.

An alternative that includes a more rapid implementation schedule and more stringent requirements (See Section XX, *supra*) is both feasible and would accomplish the majority of the project objectives. In particular, stronger regulations would better meet Objective 7, which is to implement reductions to meet the state's 2020 GHG reduction goals, and Objective 8, which is to "include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects." Draft EA at 14. In addition, objectives such as developing a regulation to meet goals of the First Update to the Scoping Plan and supporting ARB's Short Lived Climate Pollutant Plan will be better achieved with earlier, more stringent requirements. Draft EA at 14. Notably, these alternatives are "consistent with the state board's legislatively mandated responsibilities and duties" as required under ARB's certified regulatory program. 17 Cal. Code Regs. § 60006.

Although one role of the alternatives analysis is to inform public and decisionmakers of alternate project formulations that will reduce significant impacts, an alternatives analysis can also present alternatives that will increase project benefits, aside from potential environmental costs. See Kostka & Zischke, Practice Under the California Environmental Quality Act §15.7.1.

VIII. Conclusion

Steep and immediate reductions in methane emissions from the oil and gas sector are necessary to achieve the state's GHG goals, avoid adverse near-term impacts of climate change, and to protect air quality and health of Californians. As discussed above, the Center supports ARB's proposals to reduce emissions of these "superpollutants" from the oil and gas industry. At the same time we urge ARB to consider all feasible measures to eliminate methane leaks to the greatest extent possible on the shortest possible timeline.

Sincerely,

Anna Moritz
Staff Attorney

Brian Nowicki
California Climate Policy Director
(916) 201-6938
bnowicki@biologicaldiversity.org

OP-16-18
cont.

OP-16-19



Jerilyn López Mendoza
Program Manager
Environmental Affairs

555 W. Fifth Street, GCT 17E5
Los Angeles, CA 90013

tel: 213.244.5235
fax: 213.244.8257

email: jmendoza5@semprautilities.com

July 18, 2016

Joe Fischer
Project Lead, Oil & Gas Regulation
California Air Resources Board
1001 I Street – P.O. Box 2815
Sacramento, CA 95812

Re: SoCalGas and SDG&E Comments on Proposed Regulation for Greenhouse Gas
Emission Standards for Crude Oil and Natural Gas Facilities

Dear Mr. Fischer:

Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) appreciate the opportunity to submit these comments on the California Air Resources Board’s (ARB) latest version of its Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, released May 31, 2016 (Proposed Regulation). SoCalGas and SDG&E strongly support ARB’s objective to establish a comprehensive program of regulatory and market mechanisms to achieve real, cost-effective, and quantifiable reductions of greenhouse gases (GHG). The Proposed Regulation reflects many months of careful analysis by ARB staff and incorporates input from numerous stakeholders and experts in order to achieve this objective. SoCalGas and SDG&E commend ARB and its staff for these efforts and appreciate this opportunity to submit further comments. In the comments below, SoCalGas and SDG&E offer suggestions for how the Proposed Regulation can be further refined to support the goal of achieving real, cost-effective and quantifiable GHG reductions.

OP-17-1

First, SoCalGas and SDG&E urge ARB to delay implementation of the storage well monitoring requirements to allow for greater stakeholder and expert input into the cost effectiveness and feasibility of options under consideration. This will help ensure that the Proposed Regulation adopts feasible and cost-effective measures to further ARB’s objectives. Second, SoCalGas and SDG&E seek a revision to the Proposed Regulation to authorize leak detection and repair surveys to occur on an annual, rather than a quarterly basis. Similarly, this modification will further ARB’s objective to achieve feasible and cost-effective measures to reduce GHG emissions. Third, SoCalGas and SDG&E encourage ARB to consider potentially conflicting or overlapping regulatory requirements in adopting the Proposed Regulation and implementation timelines. This will help regulated entities achieve compliance in a cost-effective manner and avoid potential regulatory conflict and uncertainty. Fourth, the Proposed Regulation enforcement provisions should be modified to achieve regulatory objectives and incentivize

OP-17-2
(consolidated
comment -
parsed out in
the remainder
of this letter)

GHG reductions. Fifth, the Proposed Regulation should adopt a 100-year time horizon to remain consistent with other regulations and avoid disrupting carbon credit markets.

I. ADOPTION OF STORAGE WELL MONITORING REQUIREMENTS SHOULD BE DELAYED TO ALLOW FOR GREATER STAKEHOLDER AND EXPERT INPUT	3
II. LEAK DETECTION AND REPAIR REQUIREMENTS SHOULD BE MODIFIED TO PROVIDE FOR ANNUAL, RATHER THAN QUARTERLY, SURVEYS	3
III. THE PROPOSED REGULATION SHOULD TAKE INTO ACCOUNT POTENTIALLY CONFLICTING OR OVERLAPPING REGULATORY CONSTRAINTS AND REQUIREMENTS.....	4
IV. THE ENFORCEMENT PROVISIONS SHOULD BE CLARIFIED TO ACHIEVE REGULATORY OBJECTIVES AND INCENTIVIZE GHG REDUCTIONS	5
V. GLOBAL WARMING POTENTIAL SHOULD BE BASED ON A 100-YEAR TIME HORIZON.....	6
VI. CONCLUSION.....	7

I. ADOPTION OF STORAGE WELL MONITORING REQUIREMENTS SHOULD BE DELAYED TO ALLOW FOR GREATER STAKEHOLDER AND EXPERT INPUT

In the Appendix B Economic Analysis of the Proposed Regulation, ARB indicates that there are *zero* emission reductions and gas savings associated with the Storage Facility Monitoring Plan. Given the lack of any emissions reduction benefits attributed to the Storage Facility Monitoring Plan and the high costs for preparing and implementing such a plan, it does not appear that this element in the Proposed Regulation furthers ARB's objective to establish regulatory mechanisms to achieve real, cost-effective, and quantifiable reductions of greenhouse gas emissions. For the following reasons, SoCalGas and SDG&E recommend that ARB remove the Storage Facility Monitoring Requirements from the Proposed Regulation, or if not removed, delay the adoption of these rules to provide stakeholders and experts time to provide input—particularly with respect to costs and technical feasibility.

OP-17-3

First, there is a significant risk that this Proposed Regulation could conflict with regulations under consideration by the Division of Oil, Gas and Geothermal Resources (DOGGR), the principle state agency charged with regulating the drilling, operation, maintenance and abandonment of oil and gas wells.

OP-17-4

Second, as explained in greater detail in Attachment A, the Economic Analysis significantly underestimates the costs of implementing the Proposed Rule storage facility monitoring provisions and the technology to conduct continuous monitoring, as envisioned by ARB, is not yet proven.

OP-17-5

Third, unlike other provisions of the Proposed Regulation that have undergone two years of careful analysis and reflective input from stakeholders and experts, the Storage Monitoring requirements did not undergo a public process before submittal to the ARB Board.

OP-17-6

II. LEAK DETECTION AND REPAIR REQUIREMENTS SHOULD BE MODIFIED TO PROVIDE FOR ANNUAL, RATHER THAN QUARTERLY, SURVEYS

SoCalGas and SDG&E reviewed the Proposed Rule's Economic Analysis and identified potential issues with the cost-effectiveness analyses that form the basis for the selection of the proposed control technologies and practices. As described in greater detail in Attachment C, the Economic Analysis overstates the cost-effectiveness (i.e., under-estimates costs and over-estimates emissions) of the LDAR provisions by a factor of three or more. Best-available data indicates that annual, rather than quarterly, LDAR is expected to exceed the target Estimated Emission Reductions at a cost-effectiveness level deemed acceptable by the ARB Economic Analysis.

OP-17-7

As discussed in Attachment C, ARB does not justify the need for quarterly LDAR in the Proposed Rule because it relies on unsubstantiated source material. Historical results from an on-going Oil & Gas systems directed inspection and repair program that measures leak reductions indicate that annual surveys using a U.S. Environmental Protection Agency's (EPA) Method 21

OP-17-8

gas leak concentration measurement (i.e., screening value) of 10,000 parts per million by volume (ppmv) as a leak definition would result in emission reductions commensurate with or greater than the assumptions that form the basis for the Proposed Regulation. EPA Method 21 gas leak concentration measurements (i.e., screening values) have a very large degree of uncertainty, and gas leak rate/ EPA Method 21 concentration measurement correlations also have a very large degree of uncertainty (i.e., the gas leak associated with a Method 21 concentration measurement can vary by 3 to 4 orders of magnitude). Further, instrumentation performance limitations based on Method 21 QA/QC criteria sets forth a minimum leak definition concentration of 4,000 ppmv for many detectors. Accordingly, EPA Method 21 does not provide an accurate or effective approach to categorize leaks, establish repair thresholds and schedules, or determine regulatory compliance. In addition, a review of the methane mass emission estimates from California oil and gas components in Table B-9 in the CARB EA shows that over 98% of the emissions are from leaks from components with Method 21 screening values greater than or equal to 10,000 ppmv. This indicates a less than 2% incremental increase in emission reductions for a leak definition of Method 21 gas leak concentration measurement of 1,000 ppmv versus 10,000 ppmv. To accomplish ARB's objective to establish regulatory mechanisms to achieve quantifiable GHG reductions, SoCalGas and SDG&E encourage ARB to adopt a leak definition built on a concentration measurement of 10,000 ppmv (as discussed in Comment 14 of Attachment C), and remove EPA Method 21 measured concentration-based rule requirements (e.g., Section 95669(h), (i), and (o), including leak threshold criteria in Tables 1 through 4).

OP-17-8
cont.

OP-17-9

III. THE PROPOSED REGULATION SHOULD TAKE INTO ACCOUNT POTENTIALLY CONFLICTING OR OVERLAPPING REGULATORY CONSTRAINTS AND REQUIREMENTS

OP-17-9

ARB is one of many agencies proposing new regulations for GHG emissions from the oil and gas sector in 2016. Having so many regulatory agencies proposing separate—and sometimes conflicting—rules has the potential to create a dizzying patchwork of regulations that would generate confusion and increase cost to industry beyond the commensurate benefits in GHG and criteria pollutant emissions reductions. Accordingly, SoCalGas and SDG&E urge ARB to avoid adopting regulations that may result in regulatory conflict or overlap.

OP-17-10

In addition, as a regulated utility, SoCalGas may not be able to undertake infrastructure repair projects as quickly as ARB contemplates. SoCalGas may be required to obtain prior approval from the California Public Utilities Commission (CPUC) before it can proceed with certain projects (e.g., those constituting capital improvements). SoCalGas urges ARB to account for these and other practical considerations facing regulated utilities, including SoCalGas and SDG&E, when promulgating regulations. The most streamlined and effective way to address this issue would be to exempt Essential Public Services from this rulemaking – as recommended in our prior comment letters dated May 15, 2015 and February 18, 2016. As an alternative, if ARB is opposed to adoption of such an exemption, SoCalGas and SDG&E request that ARB allow greater flexibility with regard to the leak repair timeframes, to take into account regulatory constraints and timelines.

OP-17-11

A discussion of the various agencies with proposed rulemakings regarding GHG emissions from the oil and gas sector, as well as a summary of the potential for regulatory overlap, is provided in Attachment E.

OP-17-11
cont.

IV. THE ENFORCEMENT PROVISIONS SHOULD BE CLARIFIED TO ACHIEVE REGULATORY OBJECTIVES AND INCENTIVIZE GHG REDUCTIONS

As stated above, SoCalGas and SDG&E strongly support ARB’s objective to establish a comprehensive program of regulatory and market mechanisms to achieve real, cost-effective, and quantifiable GHG reductions and acknowledge that enforcement provisions are an essential element of an effective regulatory program. In order for enforcement provisions to achieve regulatory objectives in a cost effective manner and incent the desired behavior, it is critical that the enforcement provisions take into account the efforts of regulated entities to comply and do not penalize entities for activities that could not reasonably have been prevented.

OP-17-12

Section 95673(a)(1) of the Proposed Regulation provides that “[a]ny penalties secured by a local air district as the result of an enforcement action that it undertakes to enforce the provisions of this subarticle may be retained by the local air district.” This clause passes up on an opportunity to invest penalties toward further GHG reductions. Moreover, Section 95673(a)(1) creates an incentive for local air districts to strictly construe the regulations, find noncompliance, and seek penalties, even where extenuating circumstances may exist (*e.g.*, leak detection technology malfunction). SoCalGas and SDG&E encourage ARB to remove this provision to avoid creating this incentive and develop a regulatory framework that invests penalties toward greater GHG reductions. As an alternative, if ARB declines to remove Section 95674(c) from the Proposed Regulation, SoCalGas and SDG&E recommend the insertion of a clause to encourage regulated entities to offset excess emissions, to further the objective to reduce GHG emissions, as follows:

OP-17-13

§ 95674. Enforcement. ... (c) Each metric ton of methane emitted in violation of this subarticle constitutes a single, separate, violation of this subarticle **unless such metric ton or its carbon dioxide equivalent is fully offset (for example but without limitation, via the surrender of Cap-and-Trade Program compliance instruments to ARB).**

In addition, SoCalGas and SDG&E urge ARB to clarify that Section 95674(f) requires intentional conduct and does not strictly impose liability for inadvertent errors. Section 95674(f) of the Proposed Regulation provides that “Submitting or producing inaccurate information required by this subarticle shall be a violation of this subarticle.” The operation of such an enforcement provision, if read literally and without consideration of intent or willfulness, would be excessively harsh as inaccurate information may reasonably be “produced” by currently-available monitoring technologies. It is also possible inaccurate information could be inadvertently “submitted” in good faith to ARB or local air districts implementing the Proposed Regulation. Moreover, the first clause in Section 95674(g) covers falsification of information, so this provision is duplicative. Accordingly, SoCalGas and SDG&E recommend deletion of Section 95674(f).

OP-17-14

As an alternative, if ARB declines to remove Section 95674(f) from the regulations, then SoCalGas and SDG&E recommend that ARB clarify that the regulation is directed at knowing or intentional conduct:

OP-17-14
cont.

§ 95674. Enforcement. ... (f) **Knowingly** submitting or producing inaccurate information required by this subarticle shall be a violation of this subarticle.

Finally, in furtherance of ARB's cost-effective GHG reduction objectives, the Proposed Regulation should be revised to provide a reasonable opportunity to cure the production or submission of inaccurate information before enforcement authority is activated.

OP-17-15

V. GLOBAL WARMING POTENTIAL SHOULD BE BASED ON A 100-YEAR TIME HORIZON

As stated in our previous comments, the Proposed Regulation should reflect global warming potential (GWP) values based on the 100-year time horizon published in the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports in order to be consistent with other ARB rules as well as with EPA and international convention guidelines. ARB's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions¹ (MRR) requires that covered entities report emissions in metric tonnes of carbon dioxide equivalent (MTCO₂e) using the GWP contained in EPA's mandatory GHGs reporting regulation in 40 CFR § 98 (GHGRP): "For the purposes of this article, global warming potential values listed in Table A-1 of 40 CFR Part 98 are used to determine the CO₂ equivalent of emissions."² In addition, the GWP used in ARB's Cap-and-Trade Program³ is determined by reference to the GWP used in the MRR and, therefore, similarly uses a 100-year GWP value.⁴

OP-17-16

Moreover, the Low Carbon Fuel Standard (LCFS) likewise utilizes a 100-year GWP value for CH₄. ARB also uses a 100-year GWP value in its GHG emission inventory program, which tracks statewide GHG emissions levels.⁵ Finally, voluntary methane reduction programs also utilize 100-year GWPs for methane. We have prepared and attach a GWP Reference Table, organized by existing governmental programs, which is provided in Attachment F.

OP-17-17

Use of a 20-year time horizon for GWP values would undermine ARB's objective to establish a comprehensive program of regulatory and market mechanisms to achieve real, cost-

OP-17-18

¹ 17 Cal. Code Regs. § 95100 et seq. (MRR).

² 17 Cal Code Regs. § 95102(66).

³ 17 Cal. Code Regs. § 95800 et seq.

⁴ 17 Cal. Code Regs § 95802(56).

⁵ ARB, Global Warming Potentials (May 6, 2015), available at <http://www.arb.ca.gov/cc/inventory/background/gwp.htm> ("All GWPs used for GHG inventory purposes are considered over a 100-yr timeframe.").

effective, and quantifiable GHG reductions by muddling an otherwise consistent regulatory framework, complicating the assessment of California's progress in GHG emissions reductions, upsetting the settled expectations of stakeholders, and disrupting carbon credit markets. The use of a 20-year GWP value for CH₄ of 72 in ARB's Staff Report and Economic Analysis would result in misleading and biased cost estimates for alleged reductions in GHGs. If the 100-year GWP for CH₄ used in the MRR and Cap-and-Trade Program of 21 were used, then ARB's estimates of the costs of reductions in CO₂e emissions would have been approximately 3.4 times higher. For example, rather than the alleged \$17.27 per MTCO₂e, the non-corrected cost of emission reductions due to quarterly Leak Detection and Repair (LDAR) would be approximately \$59.21 per MTCO₂e. Indeed, as explained in Attachment B, SoCalGas has estimated the true cost to be much higher at approximately \$211.19 per MTCO₂e for a methane 100-year GWP of 21. Both of these cost estimates far exceed the marginal abatement cost of other methods of reducing CH₄ emissions and also exceed current prices for Cap-and-Trade Program compliance instruments.

OP-17-18
cont.

VI. CONCLUSION

SoCalGas and SDG&E would like to thank ARB staff for considering our feedback in previous iterations of the draft regulation. We look forward to additional dialogue on the Proposed Regulation. Please contact me if you have any questions or concerns about these comments.

Sincerely,

Jerilyn López Mendoza

Jerilyn López Mendoza
Program Manager
Energy and Environmental Affairs

ATTACHMENT A: STORAGE WELL MONITORING REQUIREMENTS

The storage well monitoring requirements in §95668(i) should be revised to reflect technology capabilities. In addition, the economic analysis should be revised and benefits should be estimated to support the proposed monitoring requirements. A detailed review of the economic analysis below discusses faulty assumptions and errors in that analysis. Further, the ARB Economic Analysis indicates zero gas savings and emission reductions for these monitoring requirements. With no benefit estimate, the requirements are not adequately justified.

OP-17-19

A. The Proposed Continuing Monitoring Technology is Not Proven. ARB's Analysis Assumes Optical Gas Imaging is Used, and OGI Has Not Been Applied for Continuous Monitoring.

§95668(i)(1)(A) – (C) provide a list of three monitoring requirements. The requirements include: (A) Continuous monitoring of the ambient air. (B) Daily screening of each storage wellhead assembly and surrounding area within 200 feet of the wellhead; or, (C) Continuous monitoring of each storage wellhead assembly and surrounding area within 200 feet of the wellhead. It is not clear from the rule text, but background documents (e.g., the cost estimates in the Economic Analysis) imply that ARB intends for condition (A) to apply, plus either (B) or (C). Comment B provides a detailed review of inadequacies in the economic analysis for these three options, including the daily “manual inspection” option in subsection (B). There are also technological issues associated with the continuous monitoring proposed in subsections (A) and (C).

OP-17-20

Support documents such as the Economic Analysis provide minimal detail on the automated monitoring technologies envisioned, and the cost estimates are based on either (1) applying optical gas imaging (OGI) with costs apparently based on presumed costs for infrared (IR) camera, such as the FLIR camera or (2) a combination of unspecified ultrasonic monitors and IR detectors. Thus, it appears that ARB anticipates OGI would be used in a continuous operating mode. SoCalGas does not believe commercial technologies are available for long-term continuous monitoring. This perspective is supported by the U.S. Department of Energy (DOE), and DOE has launched a program to address this technology gap, as discussed below.

OP-17-21

A primary concern is that the technology to conduct continuous monitoring as envisioned by ARB is not proven. Although OGI is being adapted to continuous operation, its market entry and established use for methane detection is as a hand held camera for short term field tests rather than continuous operation. In addition, OGI functionality provides leak *detection* but does not quantitate leak rates or provide quantitative assessments such as changes from a baseline level. Similarly, background documents indicate ultrasonic meters could be used for monitoring. There is no detail on the technology, commercial products, or its application. SoCalGas is not aware of such technology that could be used to meet rule requirements.

OP-17-22

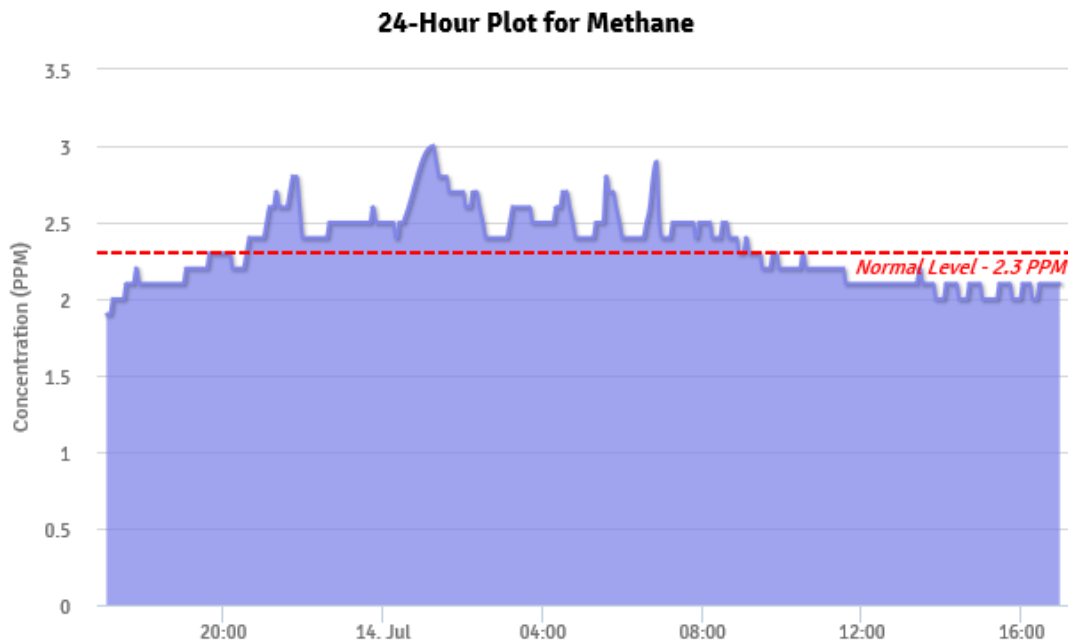
ARB improperly assumes the availability of a commercial system for fixed mounted autonomous leak detection that requires little or no user intervention. For methane detection, OGI is currently used as a hand held instrument requiring human interface for leak determination. This technology has not been commercially implemented for mounting on a permanent fixture for the purpose of autonomous ambient monitoring, or for leak detection. FLIR has investigated gimbal mounted systems for use in fixed mount applications, but software, system integration, communication, audible and visual alarm or warning system development and integration would need to be tested and validated specifically for the

OP-17-23

application and distances for storage wellhead and associated equipment. For such use, additional concerns would need to be addressed such as intrinsic safety requirements, additional labor to investigate false positives, QA/QC for continuous operation such as calibration and testing, and an alternative / telephoto lens to allow storage wellhead surveying at greater distances.

OP-17-23
cont.

In addition, ARB envisions monitoring that triggers action when levels vary by more than 10% from a baseline, which is on the order of 2 ppmv for ambient methane. This monitoring paradigm is not established and fraught with uncertainty. It is unclear how it would be implemented for the two technologies noted by ARB – i.e., OGI or ultrasonic meters. For example, since methane is ubiquitous in the atmosphere from natural and anthropogenic sources, there would likely be site-specific technical challenges that would differ for every storage field, such as: proximity to and prevalence of other methane sources (e.g., agricultural operations, wetlands), natural variability on an hourly, daily, and seasonal basis; wind direction and wind speeds; site topography; other meteorological effects; and surrounding area topography, buildings, and other physical features. Developing the basis for establishing a “baseline” would likely become a research program of indeterminate complexity, and months or years of monitoring could be required to understand the associated uncertainty and variability. Available ambient monitoring data in the vicinity of the Aliso Canyon storage facility, shown in the figure below,¹ indicate that numerous exceedances per day, none associated with a gas leak, would be the norm if a nominal baseline level is used. Constant operations oversight and reporting would be required.



OP-17-24

Similarly, assessing a 10% deviation using OGI includes analogous complexities. In addition, if OGI technology is applied (as implied in the Economic Analysis), this technology is not suited for assessing a quantitative change and has not been demonstrated in that capacity. OGI *detects* methane but does not otherwise determine or quantitate an associated measurable value. There are obvious huge technical

OP-17-25

¹ <http://fenceline.org/porter/data.php>. Data from July 14, 2016.

challenges in relying on OGI for the monitoring required by §95668(i)(1)(A) or (C). It is also unclear how ultrasonic technology noted by ARB would be used in this capacity.

Technology gaps for methane monitoring have been acknowledged by the DOE, and its Advanced Research Projects Agency-Energy (ARPA-E) program has launched research projects under the ARPA-E Methane Observation Networks with Innovative Technology to Obtain Reductions (MONITOR) program. This program is targeting development of the type of monitoring envisioned by the §95668(i). DOE notes² that MONITOR projects are,

“...developing innovative technologies to cost-effectively and accurately locate and measure methane emissions associated with natural gas production. Such low-cost sensing systems are needed to reduce methane leaks anywhere from the wellpad to local distribution networks...”

And, innovation is needed because,

“Existing methane monitoring devices have limited ability to cost-effectively, consistently, and precisely locate and quantify the rate of the leak.”

The ARPA-E MONITOR program includes six projects that would provide methane monitoring systems that provide continuous or near-continuous capabilities for sensing leaks and characterizing leak rates. Another five projects are investigating nascent technologies that may be too early in development to be integrated into a functional system. The program was launched in 2015, and projects will include a demonstration phase if earlier work meets performance objectives, with demonstration testing in the third year. Thus, progress and the potential for success of this national program to address a technology gap will not enter the demonstration phase for about two more years. In addition, there is no assurance of success. Example projects employ OGI approaches in some cases; ultrasonic monitoring implied by the ARB analysis is not being assessed.

The DOE program is indicative of the current state of the science, and shows that technology is not available to address the monitoring envisioned by §95668(i).

Due to technological limitations, SoCalGas believes it is premature to require continuous monitoring as envisioned in §95668(i), and the rule should be revised accordingly.

B. The ARB Economic Analysis Should be Revised to Address Errors, Faulty Assumptions, and Many Omitted Costs. The Analysis Also Fails to Document an Environmental Benefit.
The ARB Economic Analysis Should be Revised to Address Errors, Faulty Assumptions, and Many Omitted Costs. The Analysis Also Fails to Document an Environmental Benefit.

Storage well monitoring costs are included in Appendix B to the Staff Report, Initial Statement of Reasons. Appendix B is the ARB Economic Analysis (EA), and Section L, “Monitoring Plan,” provides ARB estimates for the storage monitoring requirements. While other proposed standards provide an estimate of associated benefits, ARB does not estimate benefits from §95668(i). The lack of a benefit determination is important because monitoring costs are significant and under-estimated in the EA. While SoCalGas understands the underlying intent of adding this section the rule, we do not believe that §95668(i) would result in significant benefits. At most, the proposed storage field Monitoring Plan may result in a brief reduction in the length of time that a major incident leaks (a day or two) and is unlikely

² DOE ARPA-E website for MONITOR program; <http://arpa-e.energy.gov/?q=arpa-e-programs/monitor>

to preclude such an incident. However, since implementation costs are estimated, that analysis is discussed and Attachment A1 includes calculation details.

The storage well monitoring costs in the ARB EA include numerous errors, deficiencies, unsupported data, inconsistencies, and other flaws that cast doubt on the validity and reliability of the cost-effectiveness analyses that is the basis for the selection of the proposed rule storage facility monitoring requirements. The questions raised from review of this analysis implies that ARB staff lack a fundamental understanding of the monitoring equipment and processes, and SoCalGas offers assistance in providing information to improve the basic understanding of implementation challenges associated with the proposed monitoring requirements.

OP-17-27
cont.

SoCalGas review of the ARB Economic Analysis determined that the EA under-estimates the cost of implementing the proposed rule storage facility monitoring provisions. A review of the ARB EA analysis and comparative alternative analysis is presented in detail in tables below. A summary is provided in Table 1, which indicates the EA under-estimates implementation costs by about a factor of 3 to 4. The data in Table 1 includes:

- The third column lists the EA cost data for storage facility monitoring as presented in Appendix B “Economic Analysis” to the ARB Staff Report: Initial Statement of Reasons (ISOR).
- The fourth column lists the ARB EA cost data for storage facility monitoring with identified corrections (primarily arithmetic errors) to the ARB calculations (identified in Attachment A1)
- The fifth column lists the SoCalGas EA cost data for storage facility monitoring, and the SoCalGas annual implementation cost estimates are about 3 (for Scenario 1) to 4 (for Scenario 2) times greater than the ARB annual implementation cost estimate (refer to the Notes column in Table 1). For Scenario 1, the SoCalGas cost estimate is based on automated monitoring at all wells. For Scenario 2, the SoCalGas cost estimate is based on manual daily monitoring at all wells. Because the SoCalGas Scenario 2 costs are based on actual monitoring costs from recent daily IR camera surveys at the Aliso Canyon storage facility (required by the SCAQMD Abatement Order Case No. 137-76), and the Scenario 1 costs are estimates for an unproven technological approach (i.e., automated monitoring), the Scenario 2 costs are more reliable; thus, SoCalGas’s best estimate is that ARB EA cost data for storage facility monitoring is about a factor of four low.

OP-17-28

Table 1. Summary of ARB EA and SoCalGas EA Cost Calculations for the Proposed Rule Storage Facility Monitoring Provisions.*

Monitoring Plan Cost Parameter	Data ID	CARB EA	CARB EA Corrected Calc Errors	SCGas EA	Notes
Annual cost of Scenario 1 (\$/yr)	A	\$6,592,207	\$5,982,247	\$21,557,820	(SC Gas “A” + “C”) / CARB “D” ~ 3
Annual cost of Scenario 2 (\$/yr)	B	\$10,831,367	\$10,427,407	\$30,507,988	(SC Gas “B” + “C”) / CARB “D” ~ 4
Annual cost of Monitoring Plan Preparation, and Recordkeeping and Reporting (\$/yr)	C	\$3,459	\$3,456	\$1,385,360	

Monitoring Plan Cost Parameter	Data ID	CARB EA	CARB EA Corrected Calc Errors	SCGas EA	Notes
Annual Cost of Monitoring Plan Provision Compliance (\$/yr)	D	\$8,723,290	\$8,208,283	\$27,418,264	D=(A+B)/2+C
Estimated Emission Reductions (mt CO ₂ e/yr)	E	Negative**	Negative**	Negative**	
Cost per Metric Ton [\$ / mt CO ₂ e]	F	Storage monitoring provides zero emission reduction benefit			

* Attachment A1 details the calculations and data used to develop Table 1.

** If promulgated, the proposed rule requirements for storage facility monitoring would most likely result in a net GHG emissions increase. The economic analysis does not consider the GHG and other pollutant emissions from installing and maintaining the monitoring equipment (e.g., combustion emissions from trucks, man-lifts, etc.) and from daily manual monitoring (i.e., combustion emissions from trucks). SoCalGas estimates that about 280 mt CO₂e/yr would be emitted from trucks to transport daily manual inspection teams.

- As summarized in Table 1, the ARB EA significantly under-estimates the cost of the proposed rule storage facility monitoring provisions. In addition, there is little support or documentation for much of the cost information and prescribed technologies. For example, ARB provides no data or evidence that automated leak detection systems have been successfully implemented for storage facility applications. Further, the references for the sources of the automated monitoring system costs (e.g., Caltrol, 2016; ARB 2016) were not provided in Appendix B, and potential options were not evident at the Caltrol website.

OP-17-28
cont.

It is also very noteworthy that, if promulgated, the proposed rule requirements for storage facility monitoring would most likely result in a net GHG emissions *increase*. The economic analysis does not consider the GHG and other pollutant emissions from installing and maintaining the monitoring equipment (e.g., combustion emissions from trucks, man-lifts, etc.) and from daily manual monitoring (i.e., combustion emissions from trucks). SoCalGas estimates that about 280 mt CO₂e/yr would be emitted from trucks to transport daily manual inspection teams.

OP-17-29

The primary reasons for the under-estimated costs include:

- The ARB EA includes zero dollars for:
 - Operation and maintenance (e.g., labor, spare parts) of the Scenario 1 automated monitoring system for Scenario 1 (automated monitoring at all wells);
 - The Method 21 leak screening and subsequent leak repair required by §95668(i)(4) and (5);
 - Contingency for undemonstrated technologies. Capital projects cost estimates for new and undemonstrated technologies and equipment applications typically include contingencies of 100 to 200% or more;
 - Monitoring Plan preparation. §95668(i)(1) requires that a Monitoring Plan be developed and submitted to the ARB, and the Monitoring Plan preparation will require monitoring system design, equipment specification, data acquisition and storage system specifications, development of operating and maintenance procedures, procedures for data review and QA, etc.;

- Recordkeeping. §95671(a)(8) lists required recordkeeping requirements that are not included in the costs. The Monitoring Plan to be submitted to the ARB will have data review and recordkeeping associated with the daily operation, maintenance, and calibration of the monitors that are not included in the costs; and
- Management and facility personnel support for survey teams (e.g., scheduling and of leak surveys and repairs with operations).

OP-17-29
cont.

- ARB under-estimates the cost of ambient monitoring. Multiple monitors will be required for 360 degree monitoring of “ambient” and “facility” methane concentrations. Depending on prevailing winds, facility terrain, and nearby methane sources (e.g., wetlands, agriculture), facility-specific monitor requirements and capital costs could vary considerably. Further, Proposed Regulation §95668(i)(6) requires notifications to ARB, DOGGR, and the local air district within 24 hours of an air monitoring system detecting natural gas that exceeds more than 10 percent of baseline. As discussed above, currently available ambient monitoring technology cannot meet this performance specification at typical ambient methane concentrations (e.g., 2 ppmv), and available data indicates that numerous exceedances would be expected each day. To comply with the rule reporting requirements and adequately investigate each exceedance, SC Gas has estimated costs such that responsible personnel are on-site 24/7 365 days per year;
- ARB under-estimates the O&M costs (e.g., training, periodic maintenance, periodic calibration, data review, data compilation) associated with the ambient monitoring equipment.
- ARB under-estimates the OGI camera per unit cost and the number of required cameras. To ensure camera availability and continuous compliance with the rule, a facility would require a spare camera.
- For Scenario 2, ARB over-estimates the number of wells that are grouped together and can be monitored by a single automated monitoring system, and thus under-estimates the Scenario 2 compliance costs. ARB assumes that 90% of the wells are grouped on a common well pad and, on average, there are three wells per well pad. 10% of the wells are single wells that would be monitored manually. At the five SoCalGas storage facilities, about 54% of the well pads have single wells (vs. 10% assumed by CARB), and about 46% of the well pads have multiple wells and would use the automated daily monitoring system for the CARB EA (vs. 90% assumed by CARB). The SoCalGas wells include about half the wells in the state and would be expected to be typical for the state population of single and grouped wells.
- The cost estimate assumes the monitoring systems have a ten year lifetime, but provide no support or documentation for this contention such as vendor warranties or historical data for like systems. The costs include no scheduled manufacturer required maintenance which would be expected for field equipment to be in service for such an extended period. Since the presumed monitoring systems do not have a track record for continuous applications, require specialized operability such as cooled systems, and use to date in periodic programs shows that device operation relies heavily on a trained operator, it is inappropriate to assume a ten year life.
- SoCalGas experience is that the ARB EA reporting estimates are over an order of magnitude low. Quarterly and annual reporting tasks include data acquisition and QA checks, and report assembly and management review. In addition, CARB requirements will obligate and trigger additional reporting for DOT/PHMSA, DOGGR, SB-1371, CPUC, etc., and data compilation and reporting for external audiences is anticipated.
- The ARB EA used a 5% discount rate based on Cal/EPA guidelines and the rationale that “five percent is the average of what the US Office of Management and Budget recommends (7 percent)

OP-17-30

and what US Environmental Protection Agency has used historically for regulatory analysis.” However, EPA used a 7% discount rate for the technical support document for the recently promulgated New Source Performance Standards for the oil and gas industry (40 CFR 60, subpart OOOOa)³ and the ARB EA-cited ICF document (ICF 2014) employs a 10% discount rate. Thus, the CARB EA 5 percent discount rate is not supported by pertinent documents and the SoCalGas EA used a conservative discount rate of 7%.

OP-17-30
cont.

Other deficiencies and flaws noted in the ARB EA include:

- Numerous arithmetic calculation errors including:
 - “Cost of Scenario 1” on page B-51;
 - “Cost of Ambient Monitoring” on page B-53;
 - “Cost of Scenario 2” on page B-53;
 - “Recordkeeping” on page B-53;
 - “Cost of Monitoring Plan” on page B-54;
- Numerous examples of inconsistent and conflicting data and information:
 - For Scenario 2, the capital cost of the detection equipment is listed as \$90,000 in the text and \$95,000 in the equation on page B-52;
 - For Scenario 2, the capital cost of the monitoring equipment per well is listed as \$54,000 in the text and \$90,000 in the equation on page B-52;
 - For Scenario 2, the daily cost of manual inspection is listed as \$350 in the text and \$285 in the equation on page B-53;
 - For recordkeeping and reporting, the cost of \$576 listed as a reporting cost in the text and a recordkeeping cost in the equation on page B-53;
 - For the cost of monitoring plan, does not include the reporting cost in the text and does include the reporting cost in the equation on page B-54.
- The errors noted above raise questions about the veracity of the analysis, and there is a general lack of coherence and critical thinking in the ARB economic analysis. Table 2 summarizes the two scenarios used to estimate the storage monitoring costs in the ARB EA, and identifies several apparently inconsistent and confused cost elements:
 - Both Scenario 1 and Scenario 2 include costs for detection equipment, but the need for and use of this equipment is not discussed or explained;
 - For Scenario 2, the need for “another device capable of detecting leaks” is discussed but the no costs are included for such a device;
 - For the Annual Cost of Monitoring for Scenario 2, it is not evident why manual monitoring was selected for 10% of wells because (1) manual monitoring has an annual cost of \$127,750/well-yr (=365 days/yr x \$350/well-day), and (2) the ARB EA determined the annual cost for a camera monitor to be $\$29,700 = \$90,000 \times 0.130 \text{ (CRF)} + \$18,000$.

OP-17-31

OP-17-32

³ EPA-HQ-OAR-2010-0505-5120. Background Technical Support Document for the Proposed New Source Performance Standards 40 CFR 60, subpart OOOOa, August 2015.

- For the Annual Cost of Monitoring for Scenario 2, manual monitoring for 10% of the wells has a daily cost of \$350 per well. The ARB EA for LDAR lists an average monitoring cost of \$60 per hour (page B-36), and this would infer that CARB estimates almost six hours are required to manually survey each well each day. This is at least an order of magnitude too high (even considering travel) and indicates a lack of consistency and comparability between the different ARB economic analyses.
- For the Annual Cost of Monitoring, Scenario 2 includes on-going costs whereas Scenario 1 has zero on-going costs.

OP-17-32
cont.

These errors indicate poor quality and a lack of attention to detail that call into question the reliability and validity of the ARB economic analysis.

Table 2. Comparison of Scenario 1 & Scenario 2 Cost Estimates for Storage Facility Monitoring.

Parameter	Scenario 1	Scenario 2	Notes / Comments
Description in Introduction	“Compliance with the daily monitoring requirement ... using ultrasound monitors in conjunction with optical monitors”		Page B-50
Annual Cost of Detection Equipment	Purchase one OGI camera per facility: 14 facilities, \$95,000 / facility	Purchase one OGI camera per facility: 14 facilities, \$95,000 / facility AND “another device capable of detecting leaks”	<ul style="list-style-type: none"> For Scenario 1 and Scenario 2, the purpose of the camera is not discussed or evident. M21 instruments required to comply with §95668(i)(4) For Scenario 2, the cost for “another device capable of detecting leaks” is not included
Annual Cost of Monitoring	Purchase 2 ultrasonic monitors and four IR detectors for each well: 408 wells, \$83,000 / well	<ul style="list-style-type: none"> For 90% of wells, purchase mounted camera monitors: \$90,000 each. One monitor to detect leaks at 3 wells with on-going costs of \$18,000/monitor-yr For 10% of wells, daily manual monitoring at \$350/well-day 	<ul style="list-style-type: none"> For Scenario 2, it is not evident why manual monitoring was selected for 10% of wells at an annual cost of \$127,750/well-yr (=365 days/yr*\$350/well-day) when a camera monitor annual cost is \$90,000*0.130 (CRF) + \$18,000=\$29,700 For both Scenario 1 and Scenario 2, no contingency included in the costs For Scenario 1, no on-going (i.e., O&M) costs but Scenario 2 has on-going costs
Ambient Air Monitoring	Purchase one? ambient monitor per facility: 14 facilities, \$84,630 / facility + \$89,500 / yr for O&M	Purchase one? ambient monitor per facility: 14 facilities, \$84,630 / facility + \$89,500 / yr for O&M	<ul style="list-style-type: none"> For both Scenario 1 and Scenario 2, no contingency included in the costs
Monitoring Plan [§95668(i)(1)]	\$0	\$0	<ul style="list-style-type: none"> For both Scenario 1 and Scenario 2, no costs for Monitoring Plan development were included
Recordkeeping	\$0	\$0	<ul style="list-style-type: none"> §95671(a)(8) lists required recordkeeping that is not included in the costs The Monitoring Plan to be submitted to the ARB will have recordkeeping associated with the daily operation, maintenance, and calibration of the monitors that are not included in the costs
Reporting	\$576	\$576	

In sum, the ARB analysis generally assumed that the monitoring equipment is purchased and that this transaction is about all that is required. There were no or minimal costs for operating and maintenance labor, ancillary equipment, or contingencies for implementing unproven monitoring systems. A lack of accounting for the facility labor and ancillary equipment required to implement the proposed rule requirements is a consistent trend throughout the ARB economic analyses. The nature of these assumptions cast doubt on the validity and reliability of the cost-effectiveness analyses that ARB developed to justify the proposed rule requirements.

OP-17-33

Additional assistance and feedback can be provided, but the comment schedule does not allow the ability to develop detailed comments and alternatives.

C. Best Practices and Other Potential Regulations Should be Relied On to Address Storage Field Concerns.

Efforts have been underway to develop best practices to provide guidance to operators on how to design and operate, and ensure integrity of underground natural gas storage. Trade associations that address all segments of the natural gas industry, including the American Petroleum Institute (API), Interstate Natural Gas Association of America (INGAA) and American Gas Association (AG), were associated with an effort to develop consensus practices and standards. This culminated in the release of two recommended practices (RP) in September 2015 accredited by the American National Standards Institute. API RP 1171 addresses storage in depleted hydrocarbon reservoirs and aquifer reservoirs, which comprise the vast majority of storage fields. API RP 1170 addresses storage in salt caverns. Members of these trade associations have committed to these practices through board resolutions, and the practices are being implemented by individual companies.

OP-17-34

In addition to these practices, President Obama signed recent federal legislation, the PIPES Act of 2016, on June 22, 2016. The PIPES Act requires the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (“PHMSA”) to issue safety standards for underground storage facilities within 2 years. Also, the U.S. EPA has initiated a process to develop performance standards for *existing* oil and gas facilities, including natural gas storage. This process was initiated on June 3, 2016 with a Notice requesting comment on an oil and gas industry Information Collection Request (ICR), and EPA will use ICR results to develop an existing source regulation. These and other examples of new, planned, or potential regulations are discussed further in Attachment E of these comments.

The new recommended practices and new, planned, and potential federal regulations provide platforms to address concerns about storage fields. SoCalGas recommends depending on those initiatives rather than adopting the proposed storage monitoring requirements in §95668(i).

D. If §95668(i) is Retained, Revisions are Warranted to Address Technical Issues and the Implementation Schedule.

As discussed above, there are technical challenges and cost implications associated with implementing the proposed rule monitoring provisions for underground storage facilities. If requirements are retained in the final rule, §95668(i) should be revised to provide the opportunity to resolve technical issues and develop a functional monitoring program with feasible criteria.

OP-17-35

Applicability of three options in §95668(i)(1)(A) – (C)

The applicability of the three “options” in §95668(i)(1)(A) – (C) should be clearly defined. Based on punctuation, it appears (A) is a stand-alone sentence, and (B) and (C) are a list of two options. In addition, associated documents imply that ARB anticipates item (A), plus (B) or (C) would be implemented. SoCalGas suggests that any one of the three options is more than sufficient to provide regular and ongoing assurance of the site status. Providing technical challenges associated with continuous monitoring can be addressed, any of the three items listed would provide real time or daily data on site integrity, and layered criteria are not warranted.

OP-17-36

In addition, selecting one option provides operators the ability to consider a near-term “manual” program based on item (B) while technology for continuous monitoring systems matures and becomes commercially available. Operators could opt to migrate from a manual process to more automated approach as warranted by technological advances.

OP-17-37

Implementation schedule and baseline determination

A longer implementation schedule should be allowed, especially if ARB considers retaining mandatory continuous monitoring (i.e., §95668(a)(1)(A) plus (B) or (C) is required). Additional time and effort is needed to identify, evaluate, and validate technologies that meet the proposed criteria as well as operator expectations for performance and reliability. As discussed above in Comment A, an extended implementation period will likely be required to develop a monitoring “baseline” that addresses site-specific variability and uncertainty. In addition, additional time may be needed to allow continuous monitoring technologies to mature.

OP-17-38

ARB should consider a staged implementation approach that includes a design and testing phase prior to requiring compliance with performance objectives. Near-term efforts to assess performance by judging deviations from baseline monitoring values unnecessarily raises questions about the ability to conform to rule requirements, because there are questions regarding the technical basis for the standard and uncertainty in establishing a baseline. Since there are many unknowns in understanding a baseline and perceived “measurable” 10 % deviations (see Comment A), an extended schedule is warranted. SoCalGas recommends an approach that allows an operator to conduct monitoring and record results, and report to ARB after one year regarding monitoring status, baseline determination, and the basis for determining “actionable” levels. Based on insight gained as monitoring data is collected, a plan can be devised for full implementation of monitoring requirements that judge performance versus baselines values.

OP-17-39

ARB should consider staged implementation and out-year definition of performance criteria

With better defined criteria established through a phase in period, detailed site-specific monitoring plans may not be necessary. As discussed in these comments, there are significant challenges and uncertainty in implementing the proposed storage monitoring criteria. While technology-forcing regulations are sometimes adopted, the implementation challenges extend beyond technology availability to include questions regarding performance measures. For example, issues with establishing a baseline and judging a 10% change are noted above. Because of many uncertainties, the monitoring program may initially be more characteristic of a data gathering research program. Such an approach is fraught with uncertainties that could affect compliance determinations if performance measures immediately apply. Compliance ambiguity due to uncertainties within the regulatory process is an untenable scenario for

OP-17-40

operators, and an approach that acknowledges shortcomings in the proposed standard is warranted if ARB chooses to implement the proposed requirements.

OP-17-40
cont.

Thus, if §95668(i) is retained, a staged approach should be considered that includes monitoring, recordkeeping and reporting, but provides for an out-year re-assessment that determines and defines performance objectives. A multi-year, staged program could provide the ability to develop a functional monitoring approach and avoid unnecessary controversy from a program that implements criteria that are not well-supported or technically proven.

OP-17-41

Attachment A1. SoCalGas Economic Analysis of Proposed Rule Storage Monitoring Provisions

Monitoring Plan Cost Parameter	Data ID	CARB EA	CARB EA Corrected Calc Errors	SCGas EA	Notes / Source(s) of CARB and SCGas Data. SC Gas proposed rule compliance costs are generally average costs for 5 storage facilities: Aliso Canyon (AC), Honor Rancho (HR), Playa Del Rey (PDR), Goleta (GOL), and Montebello (MONT)
Scenario 1 Automated Monitoring at all wells					
Annual Cost of Detection Equipment					
OGI camera purchase cost (each Facility)	A	\$95,000	\$95,000	\$0	<ul style="list-style-type: none"> - CARB EA: Page B-50. the CARB EA states that this scenario uses OGI cameras (plural) mounted on a permanent fixture, but it is not clear what a single camera mounted at facility would detect? Also, this monitoring scenario includes monitoring at each well with two ultrasonic monitors and four IR detectors. Further, CARB does not discuss that permanently mounted OGI cameras is a demonstrated technology. - CARB EA does not include any costs (labor, spare parts) for O&M of these cameras, nor allow for spare cameras to ensure continuous compliance. - SC Gas EA: Permanently mounted OGI cameras would not be included in a SCGas automated monitoring system
Number of facilities	B	14	14	14	CARB EA page B-50
Capital recovery factor	C	0.130	0.130	0.142	<ul style="list-style-type: none"> - CARB EA: page B-51 (10 years at 5%) - SCGas EA: (10 years at 7%)
Annual cost for daily leak monitoring teams (\$/yr)	C1	\$0	\$0	\$0	<ul style="list-style-type: none"> - CARB EA page B-51 - Not applicable, CARB included zero costs for IR camera operation and maintenance. - SCGas EA: Permanently mounted OGI cameras would not be included in a SCGas automated monitoring system
Annual cost for facility support (\$/yr)	C2	\$0	\$0	\$0	<ul style="list-style-type: none"> - CARB EA page B-51 - Not applicable, CARB included zero costs for facility personnel to support IR camera teams. - SCGas EA: Permanently mounted OGI cameras would not be included in a SCGas automated monitoring system
Annual cost of detection equipment (\$/yr)	D	\$172,900	\$172,900	\$0	<ul style="list-style-type: none"> D = A*B*C - CARB EA page B-51
Annual Cost of Monitoring Equipment					

Automated daily monitoring system purchase cost (each well)	E	\$83,000	\$83,000	\$77,000	<ul style="list-style-type: none"> - CARB EA: Page B-50. - CARB EA does not include any costs (labor, spare parts) for O&M of these monitors, nor allow for spare monitors to ensure continuous compliance. - has this technology been demonstrated on this scale for this duration? If this is a novel technology or application, then it would be prudent to include a large contingency (e.g., 100%) - SC Gas EA: 2 pair IR 5500 at each well + 10% contingency. Conservative installed cost
Number of wells	F	408	408	408	CARB EA Page B-51
Capital recovery factor	G	0.130	0.130	0.142	<ul style="list-style-type: none"> - CARB EA: page B-51 (10 years at 5%) - SCGas EA: (10 years at 7%)
Well monitoring on-going annual cost (each Well) (\$/well-yr)	G1	NA	NA	\$5,000	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for monitoring equipment operation and maintenance. - SCGas EA: estimates costs for maintenance, calibration, reporting, data review, and data compilation for external audiences. Estimate 5% of equipment is replaced each year +\$3,500 annual O&M per well.
Capital costs for Method 21 detectors to screen detected leaks in accordance with §95668(i)(4) (\$/facility)	G2	\$0	\$0	\$11,000	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: Cost estimate for two Method 21 instruments for each facility to ensure continuous compliance (must screen detected leaks within 24 hours) - split with LDAR
Labor costs for Method 21 screening of detected leaks in accordance with §95668(i)(4) (\$/facility-yr)	G3	\$0	\$0	\$58,240	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: Must screen detected leaks within 24 hours, assume personnel on duty or on call, and estimate 14 man-hours per week on average to comply. G3=52 (weeks/yr) *14 (hr/week) *\$80/hr need to calibrate equipment, derive to location, and measure concentration.

Annual labor costs for repair of Method 21 detected leaks in accordance with §95668(i)(5) (\$/facility-yr)	G4	\$0	\$0	\$33,280	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: Estimate 8 man-hours per week on average to comply. $G4=52 \text{ (weeks/yr)} * 10 \text{ (hr/week)} * \\$80/\text{hr}$. - Estimates for year 1 (leak = 10,000 ppmv by M21), would need to add hours for lower ppmv leak definition (e.g., 1,000 ppmv) - costs can varies greatly depending on component - does not address costs of major repairs, e.g., may need a rig for a component at wellhead
Annual material costs for repair of Method 21 detected leaks in accordance with §95668(i)(5) (\$/facility-yr)	G5	\$0	\$0	\$41,600	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: small repairs, truck use, consumables, small components/valves, etc. - Estimates for year 1 (leak = 10,000 ppmv by M21), would need to add \$\$ for lower ppmv leak definition (e.g., 1,000 ppmv) - costs can varies greatly depending on component - does not address costs of major repairs; e.g., large valves can cost about \$30,000, may need a rig for a component at wellhead
Annual cost to screen and repair Method 21 detected leaks in accordance with §95668(i)(4), (5) (\$/facility-yr)	G6	\$0	\$0	\$134,682	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: $G5=G2 * G + G3 + G4 + G5$

Well monitoring on-going annual cost to comply with the requirements of §95668(i)(6) (each Facility) (\$/facility-yr)	G7	\$0	\$0	\$0	- CARB EA: page B-51 - SCGas EA: The requirements of Proposed rule §95668(i)(6) requires notifications to ARB, DOGGR, and the local air district within 24 hours of an air monitoring system detecting natural gas that exceeds more than 10 percent of baseline. As discussed above, current monitoring technology cannot meet this performance specification at typical ambient methane concentrations (e.g., 2 ppmv), and available data indicates that numerous exceedances would be experienced each day. It is not clear whether this requirement applies to automated monitoring at wells, and this analysis assumes that it does <u>not</u> apply. However, if the §95668(i)(6) requirements do apply to automated monitoring at wells, then numerous dedicated full time positions would be required such that responsible personnel are on-site 24/7 365 days per year to comply with the rule reporting requirements and adequately investigate each exceedance. Annual compliance costs would increase by an estimated factor of 5.
Annual Cost of Monitoring Equipment (\$/yr)	H	\$4,402,320	\$4,402,320	\$8,386,620	- CARB EA page B-51, $H = E * F * G$ - SC Gas EA: $H = E * F * G + F * G1 + B * G6$
Annual Cost of Ambient Air Monitoring					
Ambient monitoring equipment purchase cost (each Facility)	I	\$84,630	\$84,630	\$400,000	- CARB EA: page B-51 - SCGas EA: Estimated facility capital cost for multiple units (Boreal TDL based-technology) for 360 degree coverage. Actual capital costs will depend on requirements for “ambient” and “facility” monitoring. - Note that these instruments will not have the sensitivity to routinely be able to distinguish a "10% change from baseline" to comply with the requirements of §95668(i)(6) at typical ambient methane concentrations (e.g., 2 ppmv).
Number of facilities	J	14	14	14	CARB EA page B-51
Capital recovery factor	K	0.130	0.130	0.142	- CARB EA: page B-51 (10 years at 5%) - SCGas EA: (10 years at 7%)

Ambient monitoring on-going annual operating cost (each Facility) (\$/facility-yr)	L	\$89,500	\$89,500	\$52,000	- CARB EA: page B-51 - SCGas EA: estimated costs for maintenance, calibration, spare parts, etc. Estimate 5% of monitors is replaced each year +\$10,000 annual O&M per monitor
Ambient monitoring on-going annual cost to comply with the requirements of §95668(i)(6) (each Facility) (\$/facility-yr)	L1	\$0	\$0	\$832,000	- CARB EA: page B-51 - SCGas EA: The requirements of Proposed rule §95668(i)(6) requires notifications to ARB, DOGGR, and the local air district within 24 hours of an air monitoring system detecting natural gas that exceeds more than 10 percent of baseline. As discussed above, currently available ambient monitoring technology cannot meet this performance specification at typical ambient methane concentrations (e.g., 2 ppmv), and available data indicates that numerous exceedances would be expected each day. To comply with the rule reporting requirements and adequately investigate each exceedance, SC Gas has estimated five dedicated full time positions such that responsible personnel are on-site 24/7 365 days per year.
Annual Cost for ambient monitoring (\$/yr)	M	\$1,407,027	\$1,407,027	\$13,171,200	M = J*(I*K+L+L1) - CARB EA: page B-51
Annual cost of Scenario 1					
Annual cost of Scenario 1 (\$/yr)	N	\$6,592,207	\$5,982,247	\$21,557,820	- CARB EA: page B-51. <u>CARB EA calculations are incorrect.</u> - Corrected CARB EA: N=D+H+M - SC Gas EA: N=D+H+M
Scenario 2		Automated Monitoring at 90% of wells, Daily Monitoring at 10% of wells		Daily Manual Monitoring at all Wells	
Annual Cost of Detection Equipment					
OGI camera purchase cost (each Facility)	O	\$95,000	\$95,000	\$230,000	- CARB EA Page B-52 - SC Gas EA: IR camera at \$110,000, spare IR camera at \$110,000 to ensure continuous compliance, plus \$10,000 in miscellaneous startup costs
Number of facilities	P	14	14	14	CARB EA page B-50
Capital recovery factor	Q	0.130	0.130	0.142	- CARB EA page B-51 (10 years at 5%) - SCGas EA (10 years at 7%)

Annual cost for daily leak monitoring teams (\$/facility-yr)	Q1	\$0	\$0	\$936,000	<ul style="list-style-type: none"> - CARB EA page B-52: Not applicable, CARB included zero costs for IR camera operation and maintenance. - SCGas EA: average cost for daily IR camera monitoring at the 5 SC Gas storage facilities. 6 crews of 2 people, 7 days a week to cover 5 storage facilities. Based on recent costs to implement IR camera surveys at Aliso Canyon per the SCAQMD Abatement Order Case No. 137-76.
Annual cost for facility support (\$/facility-yr)	Q2	\$0	\$0	\$135,000	<ul style="list-style-type: none"> - CARB EA page B-52: Not applicable, CARB included zero costs for facility personnel to support IR camera teams. - SCGas EA: average cost for 0.75 facility personnel to support daily IR camera monitoring at the 5 SC Gas storage facilities, includes coordination of survey teams and repairs with operations, and initial data review/validation and organization, safety measures, and project management. Based on recent costs to implement IR camera surveys at Aliso Canyon per the SCAQMD Abatement Order Case No. 137-76.
Capital costs for Method 21 detectors to screen detected leaks in accordance with §95668(i)(4) (\$/facility)	Q3	\$0	\$0	\$11,000	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: Cost estimate for two Method 21 instruments for each facility to ensure continuous compliance (must screen detected leaks within 24 hours) - split with LDAR
Labor costs for Method 21 screening of detected leaks in accordance with §95668(i)(4) (\$/facility-yr)	Q4	\$0	\$0	\$58,240	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: Must screen detected leaks within 24 hours, assume personnel on duty or on call, and estimate 14 man-hours per week on average to comply. =52 (weeks/yr) *14 (hr/week) *\$80/hr need to calibrate equipment, derive to location, and measure concentration.
Annual labor costs for repair of Method 21 detected leaks in accordance with §95668(i)(5) (\$/facility-yr)	Q5	\$0	\$0	\$33,280	<ul style="list-style-type: none"> - CARB EA: Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: Estimate 8 man-hours per week on average to comply. =52 (weeks/yr) *8 (hr/week) *\$80/hr. Small repairs, truck use, consumables, small components/valves, etc. - Estimates for year 1 (leak = 10,000 ppmv by M21), would need to add hours for lower ppmv leak definition (e.g., 1,000 ppmv) - costs can varies greatly depending on component - does not address costs of major repairs, e.g., may need a rig for a component at wellhead

Material costs for repair of Method 21 detected leaks in accordance with §95668(i)(5) (\$/facility-yr)	Q6	\$0	\$0	\$41,600	<ul style="list-style-type: none"> - CARB EA: page B-51. Not applicable, CARB included zero costs for Method 21 monitoring. - SCGas EA: small repairs, truck use, consumables, small components/valves, etc. - Estimates for year 1 (leak = 10,000 ppmv by M21), would need to add \$\$ for lower ppmv leak definition (e.g., 1,000 ppmv) - costs can varies greatly depending on component - does not address costs of major repairs; e.g., large valves can cost about \$30,000, may need a rig for a component at wellhead
Annual cost of detection equipment (\$/yr)	R	\$172,900	\$172,900	\$479,108	$R = (O+Q3)*P*Q$ - CARB EA: page B-51
Annual cost of daily leak surveys (\$/yr)	R1	NA	NA	\$17,336,788	$R1 = R+P*(Q1+Q2+Q4+Q5+Q6)$
Annual Cost of Monitoring					
Automated daily monitoring system at 90% of wells purchase cost (every 3 wells)	S	\$90,000	\$90,000	NA	<ul style="list-style-type: none"> - CARB EA Page B-51, assumes one monitor can detect leaks at three wells for 90% of the wells - SC Gas EA based on all wells are monitored daily "manually" by IR camera teams
Number of wells	T	408	408	408	CARB EA Page B-52
Percent of wells using automated daily monitoring system	U	90%	90%	0%	<ul style="list-style-type: none"> - CARB EA: Page B-52. Note, at the 5 SC Gas facilities, about 54% of the well pads have single wells, and about 46% of the well pads have multiple wells and would use the automated daily monitoring system for the CARB EA. Thus, SCGas costs for daily manual monitoring are underestimated. - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams
Number of wells monitored by each automated monitoring system	V	3	3	NA	<ul style="list-style-type: none"> - CARB EA: Page B-52 - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams
Capital recovery factor	W	0.130	0.130	NA	<ul style="list-style-type: none"> - CARB EA: Page B-52 (10 years at 5%) - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams

Annualized capital cost for automated monitoring equipment (\$/yr)	X	\$1,432,080	\$1,432,080	NA	- CARB EA: Page B-52. $X=(S*T*U*W)/V$ - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams
Annual on-going cost for each automated monitoring equipment (\$/monitor-yr)	Y	\$18,000	\$18,000	NA	- CARB EA: Page B-52. - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams
Annual on-going cost for automated monitoring equipment (\$/yr)	Z	\$2,203,200	\$2,203,200	NA	- CARB EA: Page B-53. $Z=(T*U*Y)/V$ - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams
Percent of wells using manual daily monitoring system	AA	10%	10%	NA	- CARB EA: Page B-53. - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams. Refer to costs above.
Daily cost of manual well monitoring (\$/well-day)	AB	\$350	\$350	NA	- CARB EA: Page B-53. - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams. Refer to costs above.
Annual cost of manual well monitoring (\$/yr)	AC	\$5,212,200	\$5,212,200	NA	- CARB EA: Page B-53. $AC=T*AA*AB*365$ (days/yr) - SC Gas EA: based on all wells are monitored daily "manually" by IR camera teams. Refer to costs above.
Annual Cost of Ambient Air Monitoring					
Ambient monitoring equipment purchase cost (each Facility)	AD	\$84,630	\$84,630	\$400,000	- CARB EA: page B-53 - SCGas EA: Estimated facility capital cost for multiple units (Boreal TDL based-technology) for 360 degree coverage. Actual capital costs will depend on requirements for "ambient" and "facility" monitoring. - Note that these instruments will not have the sensitivity to routinely be able to distinguish a "10% change from baseline" to comply with the requirements of §95668(i)(6) at typical ambient methane concentrations (e.g., 2 ppmv).
Number of facilities	AE	14	14	14	CARB EA: page B-53
Capital recovery factor	AF	0.130	0.130	0.142	- CARB EA: page B-53 (10 years at 5%) - SCGas EA: (10 years at 7%)
Ambient monitoring on-going annual cost (each Facility) (\$/facility-yr)	AG	\$89,500	\$89,500	\$52,000	- CARB EA: page B-53 - SCGas EA: estimated costs for maintenance, calibration, spare parts, etc. Estimate 5% of monitors is replaced each year +\$10,000 annual O&M per monitor

Ambient monitoring on-going annual cost to comply with the requirements of §95668(i)(6) (each Facility) (\$/facility-yr)	AG1	\$0	\$0	\$832,000	<ul style="list-style-type: none"> - CARB EA: page B-53 - SCGas EA: The requirements of Proposed rule §95668(i)(6) requires notifications to ARB, DOGGR, and the local air district within 24 hours of an air monitoring system detecting natural gas that exceeds more than 10 percent of baseline. As discussed above, currently available ambient monitoring technology cannot meet this performance specification at typical ambient methane concentrations (e.g., 2 ppmv), and available data indicates that numerous exceedances would be expected each day. To comply with the rule reporting requirements and adequately investigate each exceedance, SC Gas has estimated five dedicated full time positions such that responsible personnel are on-site 24/7 365 days per year.
Annual Cost for ambient monitoring (\$/yr)	AH	\$1,306,525	\$1,407,027	\$13,171,200	<ul style="list-style-type: none"> - CARB EA: page B-53, <u>CARB EA calculations are incorrect.</u> - Corrected CARB EA: $AH = AE \cdot (AD \cdot AF + AG + AG1)$ - SC Gas EA: $AH = AE \cdot (AD \cdot AF + AG + AG1)$
Annual cost of Scenario 2					
Annual cost of Scenario 2 (\$/yr)	AI	\$10,831,367	\$10,427,407	\$30,507,988	<ul style="list-style-type: none"> - CARB EA page B-53. <u>CARB EA calculations are incorrect.</u> - Corrected CARB EA. $AI = R + X + Z + AC + AH$. - SC Gas EA. $AI = R1 + AH$.
Record-keeping and Reporting					
Businesses impacted by Monitoring Plan	AJ	6	6	6	CARB EA page B-53
Annual cost of reporting (each business) (\$/business-yr)	AK	\$576	\$576	\$20,800	<ul style="list-style-type: none"> - CARB EA: page B-53 - SCGas EA: SCGas estimates 1 hours/week day (0.125 FTE) for reporting for both scenarios (\$80/hr). Quarterly and annual reporting requirements. - CARB requirements obligate and trigger additional reporting for DOT/PHMSA, DOGGR, SB-1371, CPUC, etc. - Also anticipate data compilation and reporting for external audiences

Annual cost of recordkeeping (each facility) (\$/facility-yr)	AL	\$0	\$0	\$83,200	- CARB EA: page B-53, not addressed by CARB EA - SCGas EA: SCGas estimates 4 hours/ week day (0.5 FTE) for final data review and QC, and recordkeeping for both scenarios (\$80/hr). Includes records of all leaks and associated repairs, pre- and post-repair Method 21 leak concentration measurements, final data review and validation, and all records stipulated in the Facility Monitoring Plan.
Monitoring Plan development (\$/facility) [§95668(i)(1)]	AM	\$0	\$0	\$20,000	- CARB EA: page B-53, not addressed by CARB EA - SCGas EA: includes monitoring system design, equipment specification, development of QA processes, implementation procedures, recordkeeping, etc. Interface with CARB
Monitoring Plan annual updates (\$/facility-yr) [§95668(i)(1)]	AN	\$0	\$0	\$4,000	- CARB EA: page B-53, not addressed by CARB EA - SCGas EA: updates based on lessons learned and monitoring system modifications, particularly for early years.
Annual Cost for Monitoring Plan (\$/facility-yr)	AO	\$0	\$0	\$6,840	- CARB EA: page B-53, not addressed by CARB EA - SCGas EA: $AO = AF * AM + AN$
Annual cost of monitoring plan development, and recordkeeping and reporting (\$/yr)	AP	\$3,459	\$3,456	\$1,385,360	- CARB EA: page B-53. <u>CARB EA calculations are incorrect.</u> - Corrected CARB EA: $AP = AJ * AK + AE * AL * AE + AO$ - SCGas EA: $AP = AJ * AK + AE * AL * AE + AO$
Annual Cost of Monitoring Plan					
Annual Cost of Monitoring Plan Provision Compliance (\$/yr)	AQ	\$8,723,290	\$8,208,283	\$27,418,264	- CARB EA page B-54. <u>CARB EA calculations are incorrect.</u> - Corrected CARB EA. $AQ = (N + AI) / 2 + AP$ - SCGas EA. $AQ = (N + AI) / 2 + AP$

Attachment B: Review of Appendix B “Economic Analysis” to the CARB Staff Report

Overview

Appendix B of the Economic Analysis of the Proposed Regulation significantly underestimates the costs of implementing the Proposed Rule storage facility monitoring provisions. This appears to be the result of flaws in some of the data and assumptions that form the basis of the Economic Analysis. As set forth in the attached cover letter, SoCalGas and SDG&E recommend that ARB delay the adoption of these rules to give stakeholders and experts more time to provide necessary input—particularly with respect to costs and technical feasibility.

OP-17-42

SoCalGas offers our assistance in providing information to improve the basic understanding of the affected emission sources. As an introduction, a brief review of the CARB EA of the proposed rule Well Stimulation provision is illustrative

Well Stimulation Provision

The Economic Analysis estimates that six separator/incinerator control systems will be sufficient to control emissions from 1,200 well stimulation activities per year. This equates to 200 well stimulations per year (or about four per week) for each control system. The Economic Analysis does not cite a specific source for the underlying data or assumptions to support this estimation. SoCalGas encourages ARB to consider adjusting the Economic Analysis to take into account the following:

OP-17-43

First, discussion with production personnel estimates full compliance with this rule provision would likely require at least twelve full-time control systems. Well stimulation treatments typically require one to three days to complete. Assuming an average of two days per well stimulation treatment, and considering real-world scheduling delays (*e.g.*, schedule changes due to mechanical and other problems, unexpected well issues, inclement weather, control equipment downtime for maintenance, etc.), a minimum of twelve, as opposed to six, full-time control systems would be required.

OP-17-44

Second, the Economic Analysis should be revised to take into account the following anticipated costs, which currently are missing from the estimate:

- transporting the separator/incinerator control systems from site to site. At a minimum, a heavy duty trailer and large towing (*e.g.*, tractor-trailer) truck would need to be purchased and dedicated to each control system;
- ancillary equipment including pipes, hoses, connectors, tools, etc.;
- operating labor. At least one full time person would be required to drive each truck and operate each control system. Additional personnel would be required to set up and break-down the equipment at each site (*e.g.*, connect pipes and hoses);
- travel costs including per diem for the operator and truck fuel;
- disruption / delay of well stimulation activities due to implementation of the control requirements;
- control system maintenance labor and spare parts; and
- management and scheduling.

OP-17-45

Moreover, the cost estimate assumes the control systems will have ten-year lifetimes, but do not cite the basis for the underlying assumption that equipment that is in continuous use and transported on a trailer over oil-field roads for ten years will remain functional for at least ten years. SoCalGas does not believe this is a realistic assumption.

OP-17-46

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

In addition, the cost estimate does not consider the GHG and other pollutant emissions from operating the control equipment (*e.g.*, combustion emissions from the incinerator and separator heater, gas leaks from separator components) and driving the tractor-trailer truck.

OP-17-46
cont.

In sum, the ARB analysis assumed that the control equipment is purchased and that this transaction is all that is required. There were no costs for any labor or transportation or ancillary equipment, and a lack of accounting for the facility labor and ancillary equipment required to implement the proposed rule control practices and technologies is a consistent trend throughout the ARB economic analyses.

Additional assistance and feedback can be provided, but the comment schedule does not allow the ability to develop detailed comments and alternatives for all affected sources. Similar examples of erroneous or questionable assumptions and analysis are available for other sources affected by the proposed rule. For these reasons, SoCalGas urges ARB to delay implementation in order to obtain additional input from stakeholders and experts.

OP-17-47

The following review of the ARB proposed rule LDAR provisions demonstrates that ARB has overestimated the cost-effectiveness of the LDAR provisions by a factor of three or more.

Leak Detection and Repair Estimates

The Economic Analysis for the proposed rule LDAR provisions appears to under-estimate the cost-per-metric-ton of CO_{2e} emissions controlled by a factor of about three, as summarized in Table 1. In addition to a direct comparison with the CARB LDAR costs, Table 1 presents SoCalGas LDAR cost-effectiveness estimates based on several assumptions, as discussed below.

- The second column lists the CARB Economic Analysis cost and emissions data for quarterly LDAR as presented in Appendix B “Economic Analysis” to the CARB Staff Report: Initial Statement of Reasons (ISOR).
- The third column lists the CARB Economic Analysis cost and emissions data for quarterly LDAR with identified corrections to the CARB calculations (identified in Attachment A and Attachment B)
- The fourth column lists the SoCalGas Economic Analysis cost and emissions data for quarterly LDAR, and the SoCalGas cost per metric ton reduction estimates are about three times greater than the CARB cost per metric ton reduction estimates. Note that SoCalGas estimates higher annual emissions reductions from LDAR than CARB (90% vs. 60%). This reduction estimate is based on measured leak reduction data and is discussed in Comment 10 of Attachment A.
 - For comparison, the fifth column lists the SoCalGas Economic Analysis cost and emissions data for quarterly LDAR using the 100-year Global Warming Potential (GWP) for methane of 21, and these SoCalGas cost per metric ton reduction estimates are about an order of magnitude greater than the CARB cost per metric ton reduction estimates. The CARB EA used a 20-year GWP for methane of 72 whereas SoCalGas believes the standard 100-year GWP for methane of 21 is more appropriate. The many reasons that the 100-year GWP is more appropriate for this analysis are presented in SoCalGas and SDG&E Comments on Revised Draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.¹

OP-17-48

¹ SoCalGas and SDG&E Comments on Revised Draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, February 18, 2016.

- The sixth column lists the SoCalGas Economic Analysis cost and emissions data for annual LDAR, and these are about the same magnitude as the CARB cost per metric ton reduction estimates. Note that SoCalGas estimates higher annual emissions reductions from annual LDAR than CARB estimates from quarterly LDAR (80% vs. 60%). This reduction estimate is based on measured leak reduction data and is discussed in Comment 10 of Attachment A.
 - For comparison, the seventh column lists the SoCalGas Economic Analysis cost and emissions data for annual LDAR using the more appropriate 100-year GWP for methane of 21 as discussed above, and the SoCalGas cost per metric ton estimates are about 3 times greater than the CARB cost per metric ton reduction estimates.

OP-17-48
cont.

The data in Table 1 demonstrate that annual, rather than quarterly, LDAR is expected to exceed the target Estimated Emission Reductions at a cost-effectiveness level deemed acceptable by the CARB Economic Analysis.

Table 1. Summary of CARB EA and SoCalGas EA Cost-Effectiveness Calculations for the Proposed Rule LDAR Provisions.*

Parameter	CARB EA (Quarterly, GWP = 72)	CARB EA (Quarterly, GWP = 72) Corrected	SCGas EA (Quarterly, GWP = 72)	SCGas EA (Quarterly, GWP = 21)	SCGas EA (Annual, GWP = 72)	SCGas EA (Annual, GWP = 21)
Cost of LDAR Program [\$ / yr]	\$10,182,299	\$9,646,628	\$36,870,175	\$36,870,175	\$9,485,109	\$9,485,109
Baseline (Uncontrolled) Methane Emissions [mt CH ₄ / yr]	13,650	13,805	11,351	11,351	11,351	11,351
Global Warming Potential [mt CO ₂ e / mt CH ₄]	72	72	72	21	72	21
Annual Emissions Reductions from LDAR	60%	60%	90%	90%	80%	80%
Estimated Emission Reductions (mt CO ₂ e / yr)	589,680	596,376	735,545	214,534	653,818	190,697
Annual Value of Gas Saved [\$ / yr]	\$1,547,683	\$1,565,257	\$889,045	\$889,045	\$790,262	\$790,262
Cost per Metric Ton [\$ / mt CO ₂ e]	\$17.27	\$16.18	\$50.13	\$171.86	\$14.51	\$49.74
Cost per Metric Ton with Gas Savings [\$ / mt CO ₂ e]	\$14.64	\$13.55	\$48.92	\$167.72	\$13.30	\$45.60

* Attachment A and Attachment B detail the calculations and data used to develop Table 1.

As summarized in Table 1, the CARB EA severely under-estimates the cost per metric ton of CO₂e emission reductions. The primary reasons for the under-estimation include:

- CARB over-estimated the baseline/uncontrolled methane leak emissions. The uncontrolled methane leak emissions listed in Table B-9 of the CARB EA are based on total hydrocarbon (THC) emission

OP-17-49

factors from a CAPCOA document², and CARB assumed that 100% of the THC was methane rather than considering that transmission and storage natural gas contains about 95% methane by volume (about 93% methane by weight) and production and processing natural gas contains about 78.8% methane by volume (about 60% methane by weight). In addition, several of the emission factors in Table B-9 were incorrectly copied from the CAPCOA document. These errors combined to over-estimate methane emissions by about 20%.

- CARB relied upon discussions with LDAR contractors for LDAR surveys cost information, and these contractors have a very strong incentive to provide lowest possible implementation costs because promulgation of quarterly LDAR requirements would be very beneficial to their business. LDAR implementation costs provided in the most recent economic analysis published by ICF International (ICF 2016)³ are more than twice the average rate provided by the LDAR contractors, and these were used for the SoCalGas EA. Based on the text on page B-36 of the CARB EA and discussion of “person year”, it is not clear that CARB staff understand that the industry standard practice is two person survey teams, both for safety reasons and to record data including number of components inspected as required by the proposed rule.
- The CARB EA did not include any costs for facility personnel to support the LDAR surveys including training, scheduling, safety orientation, survey team escort and support, leak repair, etc. SoCalGas experience is that that one FTE will be required to support the LDAR project per year.
- SoCalGas experience is that the CARB EA recordkeeping and reporting estimates are about an order of magnitude too low. These tasks include collecting and tracking daily LDAR data (including leaks found and follow-up repair and verification measurements), audio-visual inspection requirements at unmanned sites, data QA checks (e.g., compare daily LDAR data to final reports), and report assembly and review.
- The CARB EA assumed that the facilities financially benefit from the gas savings; however, transmission and storage facilities do not own the gas they transport and storage and do not benefit economically from LDAR gas savings. This is commonly acknowledged in literature on methane reduction programs from EPA and others.
- The CARB EA valued gas savings at \$3.44 per Mcf which is considerably higher than current spot prices for natural gas.
- The CARB EA used a 5% discount rate based on Cal/EPA guidelines and the rationale that “five percent is the average of what the US Office of Management and Budget recommends (7 percent) and what US Environmental Protection Agency has used historically for regulatory analysis.” However, EPA used a 7% discount rate for the technical support document for the recently promulgated New Source Performance Standards for the oil and gas industry (40 CFR 60, subpart OOOOa)⁴ and the CARB EA-cited ICF document (ICF 2014) employs a 10% discount rate. Thus, the CARB EA 5 percent discount rate is not supported by pertinent documents and the SoCalGas EA used a conservative discount rate of 7%.

OP-17-49
cont.

Other deficiencies and flaws noted in the CARB EA include:

² CAPCOA, ARB. 1999. The California Air Resources Board Staff California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities.

³ ICF 2016. “Economic Analysis of Methane Reduction Potential from Natural Gas Systems,” ICF International, May 2016

⁴ EPA-HQ-OAR-2010-0505-5120. Background Technical Support Document for the Proposed New Source Performance Standards 40 CFR 60, subpart OOOOa, August 2015.

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

- The calculation of “Cost per Ton with Savings” on page B-41 is incorrect.
- Engineering units are frequently incorrect (e.g., the units for the Conversion Factor of 836.2 should be scf/kg-mole rather than kg/kg-mole as listed on page B-40).
- Table B-9 of the CARB EA lists 1,318,700 components to survey, but page B-35 calculates a total of 1,339,185 that includes 20,485 well casings at heavy oil facilities and 939 compressors * 11 components per compressor, and this total is used to calculate the survey team years. Thus, the CARB EA total component basis for compliance costs (1,339,185) differs from the CARB EA total component basis for emission estimates (1,318,700) and is a flaw in the analysis. Further, the 1,339,185 component total is flawed because:
 - The 20,485 well casings at heavy oil facilities do not require quarterly LDAR, they require measurement of "the natural gas flow rate from the well casing vent annually by direct measurement" [§95668(h)(1)]; thus, the well casings should not be included in the LDAR components total.
 - An additional deficiency in the CARB EA is that an economic analysis for the proposed rule well casings provision is not provided.
 - Compressors (and the associated drivers) typically have many more than 11 components. Table W-1B to Subpart W of Part 98 lists a total of 259 components per compressor in the production segment to be used for GHG emissions reporting. Larger compressors employed in transmission and storage would be expected to have a higher total component count.

OP-17-49
cont.

Finally, it is notable that the CARB EA states,

“the capital cost of larger repairs is not included based upon the assumption that these repairs would need to be made regardless of an LDAR program; because ***the operator would repair these parts regardless of the LDAR program [emphasis added]***”

And

“Emissions were estimated using emission factors from CAPCOA guidelines (CAPCOA, 1999), which also accounted for 'super leaker' components. These are components that leak at a rate several times the rate of what is expected from a typical component, and make up the majority of emissions. Several studies that have reported measurements of CH₄ emissions from natural gas production sites share a common observation-the existence of skewed emissions distributions, where a small number of sites or facilities account for a large proportion of emissions.”

OP-17-50

These two statements suggest that the majority of gas leak emissions would be controlled regardless of the implementation of an LDAR program. This simple assumption is very compelling and casts doubt on the need for and viability of the proposed rule LDAR provision.

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Attachment A. SoCalGas Economic Analysis of Proposed Rule LDAR Provisions

LDAR Cost Parameters for <u>Cost of LDAR Program</u>	Data ID	CARB EA (Quarterly, GWP = 72)	CARB EA (Quarterly, GWP = 72) Corrected Calc Errors	SCGas EA (Quarterly, GWP = 72)	SCGas EA (Quarterly, GWP = 21)	SCGas EA (Annual, GWP = 72)	SCGas EA (Annual, GWP = 21)	Notes / Source(s) of CARB and SCGas Data
Number of components to survey [components]	A	1,318,700	1,318,700	1,318,700	1,318,700	1,318,700	1,318,700	- CARB EA: Table B-9 - SC Gas (and CARB Corrected): Used same total as CARB EA to be consistent with basis for annual emissions estimate (i.e., data in Table B-9)
Work hours per year [hr/yr]	B	2,080	2,080	2,080	2,080	2,080	2,080	CARB EA: page B-36
Components surveyed per hour per survey team [components / team-hr]	C	34	34	34	34	34	34	CARB EA: page B-36, CARB refers to Person Year (PY) rather than survey team year.
Number of persons per survey team [persons / team]	D	1?	1?	2	2	2	2	- CARB EA: page B-36. CARB EA page B-36, CARB refers to Person Year (PY) rather than survey team year. <u>It is not clear that CARB understands that a 2 man team is standard for LDAR.</u> - SCGas EA: <u>used the standard two persons per survey team.</u> Two people are generally required for all survey teams for safety reasons and to record data including number of components inspected.
Components inspected in one survey team year [components / team-yr]	E	68,250	70,720	70,720	70,720	70,720	70,720	E=B*C - Note that CARB calculated 68,250 on CARB EA page B-36, and this appears to be a <u>calculation error</u>

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Survey team years for <u>one survey</u> of all components [team-yrs]	F	19.6	18.6	18.6	18.6	18.6	18.6	<p>F = A/E, note that CARB calculated 19.6 on CARB EA page B-36, and this appears to be due to the use of inconsistent component population data. Table B-9 lists 1,318,700 components to survey, but page B-35 calculates a total of 1,339,185 that includes 20,485 well casings at heavy oil facilities and 939 compressors * 11 components per compressor and this total is used to calculate the survey team years. <u>This component total is incorrect</u> for several reasons:</p> <ul style="list-style-type: none"> - it is different from the component total in Table B-9 that is the basis for the emissions estimate - the 20,485 well casings at heavy oil facilities do not require quarterly LDAR, they require measurement of "the natural gas flow rate from the well casing vent annually by direct measurement" [§95668(h)(1)]; thus, the well casings should not be included in the LDAR components total - compressors typically have many more components than 11. Table W-1B to Subpart W of Part 98 lists a total of 259 components per compressor in the production segment to be used for GHG emissions reporting. Larger compressors employed in transmission and storage would be expected to have a higher total compressor count.
Average survey team days per facility [team-days/facility]	F1	6.4	6.1	6.1	6.1	6.1	6.1	$F1 = (F*B)/(L*8)$
<i>Check calc</i>		6.1	6.1	6.1	6.1	6.1	6.1	$= (A/L)/(C*8)$
Survey team cost per hour [\$ /team-hr]	G	\$60.00	\$60.00	\$142.06	\$142.06	\$142.06	\$142.06	<p>- CARB EA: page B-36</p> <p>- SCGas EA: rate from ICF 2016</p>
Number of inspections/surveys per year [surveys / yr]	H	4	4	4	4	1	1	CARB EA: page B-37

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Facility personnel support - hours/survey (scheduling, safety, escort, leak repairs & documentation, etc.) [hrs / survey]	I	0	0	48.5	48.5	48.5	48.5	- Not addressed by the CARB EA - SCGas EA: estimate of hours required for storage facility reps = one hour for every hour survey team on site, based on historical support for Leak surveys at storage facilities (e.g., training, scheduling, safety orientation, survey team escort and support, leak repair, etc.) I = F1*8 (hr/day)
Facility personnel support, labor rate [\$ / hr]	J	0	0	\$80.00	\$80.00	\$80.00	\$80.00	- Not applicable for the CARB EA - SCGas EA: data from storage facility reps
Annual Cost for Inspections per survey team year [\$ / survey team-yr?]	K	\$499,200	\$499,200	\$1,847,539	\$1,847,539	\$461,885	\$461,885	K=B*G*H+B*H*J - Note, CARB EA calcs are confusing and engineering units are not clear.
Number of Facilities [facilities]	L	799	799	799	799	799	799	CARB EA page B-37
Set up cost per facility [\$ / facility]	M	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	CARB EA page B-37
Capital recovery factor	N	0.130	0.130	0.244	0.244	0.244	0.244	- CARB EA: page B-37, assumes same LDAR vendor conducts inspections at every facility for 10 years - Based on experience, SCGas assumes LDAR vendors are periodically changed, assume after 5 years on average for all facilities and discount rate of 7%
Total Setup Cost [\$]	O	\$155,805	\$155,805	\$292,434	\$292,434	\$292,434	\$292,434	O=L*M*N
Businesses impacted by LDAR Provision [businesses]	P	201	201	201	201	201	201	CARB EA page B-37
Average number of facilities per business [facilities / business]	P1	5.24	3.98	3.98	3.98	3.98	3.98	P1 = R/P
Annual cost of reporting [\$ / business-yr]	Q	\$144	\$144	\$2,864	\$2,864	\$956	\$956	- CARB EA: page B-37 - Based on experience, SCGas estimates 0.25 man-days to assemble and QA data from each survey, and 4 hours to prepare report and obtain report approval for the business (\$80/hr) Q = P1*H*J*0.25*8+4*J

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Facilities impacted by LDAR [facilities]	R	1,054	799	799	799	799	799	CARB EA: page B-37 lists 1,054 facilities and this total includes Well Casing Facilities. However, as discussed under ID F, Well Casing Facilities have an annual gas volumetric rate measurement requirement that is not LDAR, and the reporting costs for Well Casing Facilities should not be included.
Annual cost of recordkeeping per facility impacted by LDAR [\$ / facility-yr]	S	\$192	\$192	\$1,942	\$1,942	\$485	\$485	- CARB EA: page B-37 - SCGas EA: estimates 1 hour for recordkeeping for each day the survey team is on-site (\$80/hr) $S = H * F1 * 1 \text{ (hr/day)} * J$
Recordkeeping and Reporting Cost [\$ / yr]	T	\$231,312	\$182,352	\$2,127,092	\$2,127,092	\$580,013	\$580,013	$T = P * Q + R * S$
Cost of LDAR Program [\$ / yr]	U	\$10,182,299	\$9,646,628	\$36,870,175	\$36,870,175	\$9,485,109	\$9,485,109	$U = F * K + O + T$
<i>check calc</i>		\$9,695,588	\$9,646,628	\$36,870,175	\$36,870,175	\$9,485,109	\$9,485,109	$= (A * H((G + J)) + O + T$
<u>LDAR Cost Parameters for Emissions and LDAR Emission Reductions</u>	ID	CARB EA (Quarterly, GWP = 72)	CARB EA (Quarterly, GWP = 72) Corrected Calc Errors	SCGas EA (Quarterly, GWP = 72)	SCGas EA (Quarterly, GWP = 21)	SCGas EA (Annual, GWP = 72)	SCGas EA (Annual, GWP = 21)	Notes / Source(s) of CARB and SCGas Data

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Baseline (Uncontrolled) Methane Emissions [mt CH ₄ / yr]	V	13,650	13,805	11,351	11,351	11,351	11,351	<ul style="list-style-type: none"> - CARB EA: Table B-9 - SCGas EA: refer to Attachment B. CARB over-estimated the baseline/uncontrolled gas leak methane emissions. The uncontrolled methane leak emissions listed in Table B-9 of the EA are based on total hydrocarbon (THC) emission factors from a CAPCOA document, and CARB assumed that 100% of the THC was methane rather than considering that transmission and storage natural gas contains about 94.9% methane by volume (about 92.5% methane in THC by weight) and production and processing natural gas contains about 78.8% methane by volume (about 60% methane in THC by weight). In addition, three of the emission factors in Table B-9 were incorrectly copied from the CAPCOA document. These errors combined to over-estimate methane emissions by about 20%.
Global Warming Potential [mt CO ₂ e / mt CH ₄]	W	72	72	72	21	72	21	<ul style="list-style-type: none"> - CARB EA: page B-38 - SCGas EA: considers both 20-yr GWP (= 72) and 100-yr GWP (= 21)
Baseline (Uncontrolled) Carbon Dioxide Equivalents Emissions [metric tons CO ₂ e / yr]	X	982,800	993,960	817,272	238,371	817,272	238,371	X=V*W
Annual emissions reductions from LDAR	Y	60%	60%	90%	90%	80%	80%	<ul style="list-style-type: none"> - CARB EA: page B-38 - SCGas EA: 80% from CAPP study based on <u>measured</u> emissions associated with <u>annual</u> DI&M (“Management of Fugitive Emissions at Upstream Oil and Gas Facilities”, Canadian Association of Petroleum Producers (CAPP), January 2007.) 90% for quarterly estimated based on assumption of linear leak growth rate moderated by practical considerations of extended repair times for critical components and unsafe to access components.
Estimated emission reductions (mt CO ₂ e / yr)	Z	589,680	596,376	735,545	214,534	653,818	190,697	Z=X*Y

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

LDAR Cost Parameters for <u>Savings</u> from LDAR Emission Reductions	ID	CARB EA (Quarterly, GWP = 72)	CARB EA (Quarterly, GWP = 72) Corrected Calc Errors	SCGas EA (Quarterly, GWP = 72)	SCGas EA (Quarterly, GWP = 21)	SCGas EA (Annual, GWP = 72)	SCGas EA (Annual, GWP = 21)	Notes / Source(s) of CARB and SCGas Data
Volume Percent methane in natural gas	AA	94.9%	94.9%	89.9%	89.9%	89.9%	89.9%	- CARB EA: page B-39 - SCGas EA: assumes 31.3% of the annual leakage is from natural gas with 78.8% methane and 68.7% of the annual leakage is from natural gas with 94.9% methane - based on 2104 O&G GHG Inventory which had 1.82 million mt methane emissions from O&G extraction and production and 3.99 million mt methane emissions from pipelines (http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_sector_sum_2000-14ch4.pdf)
Volume of Gas Saved [scf]	AB	449,907,765	455,016,608	592,696,445	592,696,445	526,841,285	526,841,285	$AB = (V * Y * 836.2 \text{ [scf/kg-mol]} * 1,000 \text{ [kg/mt]}) / (16.04 \text{ [kg CH}_4 \text{ / kmol CH}_4\text{]} * AA)$
Natural gas value [\$ / Mcf]	AC	\$3.44	\$3.44	\$3.00	\$3.00	\$3.00	\$3.00	- CARB EA: page B-40 - SCGas EA: estimated current spot price for field gas (e.g., more C2, C3, C4 and value than pipeline gas)
Percent of gas savings that has economic value for the facility	AD	100%	100%	50%	50%	50%	50%	- CARB EA: page B-40 assumes 100% of the gas savings has value for the facility - SCGas EA: estimates that 50% of the gas savings has value for the facility because Transmission and Storage facilities do not own the gas they transport and store, and do not benefit economically from LDAR gas savings.
Annual value of gas saved [\$ / yr]	AE	\$1,547,683	\$1,565,257	\$889,045	\$889,045	\$790,262	\$790,262	$AE = (AB * AC * AD) / 1,000 \text{ [Mcf/scf]}$
LDAR Cost Parameters for <u>Cost</u> per Metric Ton of the LDAR Provision	ID	CARB EA (Quarterly, GWP = 72)	CARB EA (Quarterly, GWP = 72) Corrected Calc Errors	SCGas EA (Quarterly, GWP = 72)	SCGas EA (Quarterly, GWP = 21)	SCGas EA (Annual, GWP = 72)	SCGas EA (Annual, GWP = 21)	Notes / Source(s) of CARB and SCGas Data

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Cost per Metric Ton [\$ / mt CO ₂ e]	AF	\$17.27	\$16.18	\$50.13	\$171.86	\$14.51	\$49.74	$AF = U / Z$
Cost per Metric Ton with gas savings [\$ / mt CO ₂ e]	AG	\$14.64	\$13.55	\$48.92	\$167.72	\$13.30	\$45.60	$AG = (U - AE) / Z$

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

Attachment B. SoCalGas Estimate of Proposed Rule LDAR Provision Methane Emission Reductions

LDAR Emissions Parameter	Component	ID	CARB EA (Table B-9)	CARB EA (corrected)	SC Gas EA	Notes / Source(s) of CARB and SCGas Data
Components < 10,000 ppm						
Number of Components	Valves	A	236,131	236,131	236,131	CARB EA: Table B-9
	Connectors	B	870,766	870,766	870,766	
	Flanges	C	158,486	158,486	158,486	
	Open end lines	D	692	692	692	
	Pump Seals	E	2,312	2,312	2,312	
	Others (compressors, hatches, etc.)	F	21,088	21,088	21,088	
Emission Factors (kgTHC/hr/source)	Valves	G	-	3.50E-05	3.50E-05	From Table IV-2c CAPCOA 1999, THC Emission Factors (THC EF) assumes only Gas/Light Liquid service, no Light Crude or Heavy Crude Oil
	Connectors	H	-	1.20E-05	1.20E-05	
	Flanges	I	-	2.80E-05	2.80E-05	
	Open end lines	J	-	2.40E-05	2.40E-05	
	Pump Seals	K	-	9.96E-04	9.96E-04	
	Others (compressors, hatches, etc.)	L	-	1.47E-04	1.47E-04	
g THC per Component per Year	Valves	M	-	307	307	M=G*(8760 hr/yr)*(1000g/kg)
	Connectors	N	-	105	105	N=H*(8760 hr/yr)*(1000g/kg)
	Flanges	O	-	245	245	O=I*(8760 hr/yr)*(1000g/kg)
	Open end lines	P	-	210	210	P=J*(8760 hr/yr)*(1000g/kg)
	Pump Seals	Q	-	8,725	8,725	Q=K*(8760 hr/yr)*(1000g/kg)
	Others (compressors, hatches, etc.)	R	-	1,288	1,288	R=L*(8760 hr/yr)*(1000g/kg)
g CH4 per Component per Year	Valves	S	307	307	252	- CARB calculation uses equations for M through R with apparent errors for V and W (V= 210, W= 8725). The results, S through X, are mistaken as g CH4 when the units are g THC (i.e., CARB assumes the THC is 100% methane). This error is propagated in the subsequent calculations.
	Connectors	T	105	105	86	
	Flanges	U	245	245	202	
	Open end lines	V	1,288	210	173	
	Pump Seals	W	1,288	8,725	7,174	

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

	Others (compressors, hatches, etc.)	X	1,288	1,288	1,059	- SCGas EA assumes 31.3% of the annual leakage is from natural gas with 78.8% methane and 68.7% of the annual leakage is from natural gas with 94.9% methane - based on 2104 O&G GHG Inventory which had 1.82 million mt methane emissions from O&G extraction and production and 3.99 million mt methane emissions from pipelines (http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_sector_sum_2000-14ch4.pdf). . Conversions to weight % methane are I.D. CH and CH, respectively. (e.g., $S = 0.313 * M * CH + 0.687 * M * CI$)
MT CH4 per Year	Valves	Y	72.49	72.40	59.52	$Y = S * A / (1,000,000 \text{ g/MT})$
	Connectors	Z	91.43	91.53	75.26	$Z = T * B / (1,000,000 \text{ g/MT})$
	Flanges	AA	38.83	38.87	31.96	$AA = U * C / (1,000,000 \text{ g/MT})$
	Open end lines	AB	0.89	0.15	0.12	$AB = V * D / (1,000,000 \text{ g/MT})$
	Pump Seals	AC	2.98	20.17	16.59	$AC = W * E / (1,000,000 \text{ g/MT})$
	Others (compressors, hatches, etc.)	AD	27.16	27.16	22.33	$AD = X * F / (1,000,000 \text{ g/MT})$, note that CARB calculated 27.06 on CARB EA Table B-9, and this appears to be a calculation error
Global Warming Potential		GWP	72			
MT CO2e per Year	Valves	AE	5,219.4	5,212.6	4,285.8	$AE = GWP * Y$
	Connectors	AF	6,583.0	6,590.5	5,418.7	$AF = GWP * Z$
	Flanges	AG	2,795.7	2,798.9	2,301.2	$AG = GWP * AA$
	Open end lines	AH	64.2	10.5	8.6	$AH = GWP * AB$
	Pump Seals	AI	214.4	1,452.4	1,194.1	$AI = GWP * AC$
	Others (compressors, hatches, etc.)	AJ	1,948.2	1,955.2	1,607.5	$AJ = GWP * AD$, note that CARB calculated 1,948.2 on CARB EA Table B-9, and this appears to be a calculation error
Components > 10,000 ppm						
Number of Components	Valves	AK	5,367	5,367	5,367	CARB EA Table B-9
	Connectors	AL	19,790	19,790	19,790	
	Flanges	AM	3,602	3,602	3,602	
	Open end lines	AN	16	16	16	
	Pump Seals	AO	53	53	53	

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

	Others (compressors, hatches, etc.)	AP	477	477	477	
Emission Factors (kgTHC/hr/source)	Valves	AQ	1.39E-01	1.39E-01	1.39E-01	From Table IV-2c CAPCOA 1999, THC Emission Factors (THC EF) assumes only Gas/Light Liquid service, no Light Crude or Heavy Crude Oil
	Connectors	AR	2.59E-02	2.59E-02	2.59E-02	
	Flanges	AS	6.10E-02	6.10E-02	6.10E-02	
	Open end lines	AT	5.49E-02	5.49E-02	5.49E-02	
	Pump Seals	AU	8.90E-02	8.90E-02	8.90E-02	
	Others (compressors, hatches, etc.)	AV	1.38E-01	1.38E-01	1.38E-01	
g THC per Component per Year	Valves	AW	-	1,214,136	1,214,136	AW=AQ*(8760 hr/yr)*(1000g/kg)
	Connectors	AX	-	226,884	226,884	AX=AR*(8760 hr/yr)*(1000g/kg)
	Flanges	AY	-	534,360	534,360	AY=AS*(8760 hr/yr)*(1000g/kg)
	Open end lines	AZ	-	480,924	480,924	AZ=AT*(8760 hr/yr)*(1000g/kg)
	Pump Seals	BA	-	779,640	779,640	BA=AU*(8760 hr/yr)*(1000g/kg)
	Others (compressors, hatches, etc.)	BB	-	1,205,376	1,205,376	BB=AV*(8760 hr/yr)*(1000g/kg)
g CH4 per Component per Year	Valves	BC	1,217,645	1,214,136	998,251	<p>- CARB calculation uses equations for AW through BB with apparent errors for BC, BE, BF, BG and BH. Calculated values are BC=1,214,136 BE=534,360 BF=480,924 BG =779,640 and BH 1,205,376. The results, BC through BH, are mistaken as g CH4 when it is g THC (i.e., CARB assumes the THC is 100% methane). This error is propagated in the subsequent calculations.</p> <p>- SCGas EA assumes 31.3% of the annual leakage is from natural gas with 78.8% methane and 68.7% of the annual leakage is from natural gas with 94.9% methane - based on 2104 O&G GHG Inventory which had 1.82 million mt methane emissions from O&G extraction and production and 3.99 million mt methane emissions from pipelines (http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_sector_sum_2000-14ch4.pdf). Conversions to weight % methane are I.D. CH and CH, respectively. (e.g., BC = 0.313*AW*CH + 0.687*AW*CI)</p>
	Connectors	BD	226,884	226,884	186,542	
	Flanges	BE	480,924	534,360	439,346	
	Open end lines	BF	1,208,880	480,924	395,411	
	Pump Seals	BG	1,208,880	779,640	641,013	
	Others (compressors, hatches, etc.)	BH	1,208,880	1,205,376	991,049	

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

MT CH₄ per Year	Valves	BI	6,534.64	6,516.27	5,357.62	BI=AK*BC/(1,000,000 g/MT), note that CARB calculated 6,534.64 on CARB EA Table B-9, and this appears to be a calculation error
	Connectors	BJ	4,490.06	4,490.03	3,691.67	BJ=AL*BD/(1,000,000 g/MT), note that CARB calculated 4,490.06 on CARB EA Table B-9, and this appears to be a calculation error
	Flanges	BK	1,732.27	1,924.76	1,582.52	BK=AM*BE/(1,000,000 g/MT), note that CARB calculated 1,732.27 on CARB EA Table B-9, and this appears to be a calculation error
	Open end lines	BL	19.02	7.69	6.33	BL=AN*BF/(1,000,000 g/MT), , note that CARB calculated 19.02 on CARB EA Table B-9, and this appears to be a calculation error
	Pump Seals	BM	63.53	41.32	33.97	BM=AO*BG/(1,000,000 g/MT), note that CARB calculated 63.53 on CARB EA Table B-9, and this appears to be a calculation error
	Others (compressors, hatches, etc.)	BN	577.17	574.96	472.73	BN=AP*BH/(1,000,000 g/MT), note that CARB calculated 577.17 on CARB EA Table B-9, and this appears to be a calculation error
MT CO₂e per Year	Valves	BO	470,494.1	469,171.3	385,748.3	BO = GWP * BI, note that CARB calculated 470,494.1 on CARB EA Table B-9, a propagation of previous calculation error.
	Connectors	BP	323,284.7	323,282.5	265,799.9	BP = GWP * BJ, note that CARB calculated 323, 284.7 on CARB EA Table B-9, a propagation of previous calculation error.
	Flanges	BQ	124,723.2	138,583.1	113,941.7	BQ = GWP * BK , note that CARB calculated 124,GWP3.2 on CARB EA Table B-9, a propagation of previous calculation error.
	Open end lines	BR	1,369.4	554.0	455.5	BR = GWP * BL, note that CARB calculated 1,369.4 on CARB EA Table B-9, a propagation of previous calculation error.
	Pump Seals	BS	4,574.4	2,975.1	2,446.1	BS = GWP * BM, note that CARB calculated4, 574.4 on CARB EA Table B-9, a propagation of previous calculation error.
	Others (compressors, hatches, etc.)	BT	41,556.5	41,397.4	34,036.6	BT = GWP * BN, note that CARB calculated 41,556.5 on CARB EA Table B-9, a propagation of previous calculation error.
Total	Components	BU	1,318,780	1,318,780	1,318,780	Sum of Components, A-F and AK-AP, note that CARB calculated 1,318,700 on CARB EA Table B-9, a propagation of previous calculation error.
	MT CH ₄ /Year	BV	13,650	13,805	11,351	Sum of MT CH ₄ /Year, Y-AD and BI-BN

July 14, 2016

IES Review of Appendix B “Economic Analysis” to the CARB Staff Report: ISOR

	MT CO2e/Year	BW	982,827	992,028	815,637	Sum of MT CO2e/Year, AE-AJ and BO-BT
Composition of Natural Gas	Species		Composition			
Production, mol %	methane	BX	78.8%			Composition of methane in Natural Gas from CARB EA p. B-15 Percentages of ethane, propane, higher hydrocarbons and non-hydrocarbons estimated based on relative percentages reported for typical associated gas composition in Wikipedia.
	ethane	BY	6.14%			
	propane	BZ	7.36%			
	higher hydrocarbon	CA	6.03%			
	non-hydrocarbon	CB	1.67%			
			100.00%			
Pipeline, vol%	methane	CC	95.00%			Composition of Natural Gas from Table A-44 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014
	ethane	CD	2.79%			
	propane	CE	0.48%			
	higher hydrocarbon	CF	0.30%			
	non-hydrocarbon	CG	1.43%			
			100.00%			
Weight % of Methane in THC						
Production	methane, weight %	CH	59.52%			$CH = BX * 16.04 / [BX * 16.04 + BY * 30.07 + BZ * 44.10 + CA * 58.12]$ and assumes that all of the higher hydrocarbons are butane, MW 58.12 g/mol
Pipeline	methane, weight %	CI	92.56%			$CI = CC * 16.04 / [CC * 16.04 + CD * 30.07 + CE * 44.10 + CF * 58.12]$ and assumes that all of the higher hydrocarbons are butane, MW 58.12 g/mol

Attachment C: Comments on Definitions and Standards

Comments on Proposed Rule Definitions

1. §95667(19). For the definition of “flash or flashing” we suggest the following change (added text in ***bold italics***) “gas ~~entrained~~ ***dissolved*** in crude oil, condensate, or produced water under pressure is released when the liquids are subject to a decrease in pressure.”
2. §95667(29). The definition for “natural gas” states “Natural gas may be field quality (which varies widely) or pipeline quality.” “Pipeline quality natural gas” is not defined in the proposed rule while there is no mention of “Commercial quality natural gas” as defined in §95667(10).
3. §95667(30). For the definition of “Natural gas gathering and boosting station” we suggest the following change: “Natural gas gathering and boosting station means all equipment and components located within a facility fence line associated with moving natural gas ***from production fields*** to a processing plant or natural gas transmission pipeline.”
4. §95667(46). The definition of “Pressure separator” should be consistent with the definition of “Separator.”
5. §95667(46). For the definition of “Separator” we suggest the following change: “Separator” means any tank or pressure separator used for the primary purpose of separating crude oil, ***natural gas*** and/or produced water or for separating natural gas, condensate, and/or produced water. In crude oil production a separator may be referred to as a Wash Tank or as a three-phase separator. In natural gas production fields, a separator may be referred to as a heater/separator.”
6. §95667(61). For the definition of “Vapor control efficiency” we suggest the following change: “Vapor control efficiency” means the ability of a vapor control device to control emissions, expressed as a percentage, which can be estimated by calculation or by measuring the total hydrocarbon ~~concentration~~ ***mass flow rate*** at the inlet and outlet of the vapor control device.”
7. §95668(d)(2)(A) & (e)(2)(A) allows an exemption for compressors with use of less than 200 hours per year. However, the current rule language limits the exemption to natural gas powered compressors. We suggest the following change to include electric driven natural gas compressors.
 - “Reciprocating natural gas ~~powered~~ compressors that operate....”
 - “Centrifugal natural gas ~~powered~~ compressors that operate....”
8. We believe the intent is to apply these requirements to stationary compressors similar to the existing GHG MRR (40 CFR, Part 98, Subpart W). For clarity, we suggest the following change.
 - 95668(d)(1): “Except as provided in section 95668(d)(2), the following requirements apply to ***stationary*** reciprocating natural gas compressors located at facilities listed in section 95666.”
 - 95668(e)(1): “Except as provided in section 95668(e)(2), the following requirements apply to ***stationary*** centrifugal natural gas compressors located at facilities listed in section 95666.”
9. §95669(b) LDAR
 - We request an exemption be added for components that do not contain methane. Proposed language from the GHG MRR section 95153(o) “***Component types in streams with gas content less than 10 percent CH₄ plus CO₂ by weight***”

OP-17-51

10. §95669 (b)(7) for clarity we suggest the following change

“One-half inch and smaller stainless steel tube fittings used to supply natural gas to equipment or instrumentation that have been tested using US EPA Method 21 and reported to be below the minimum allowable leak threshold *during the first quarterly survey performed after their installation date.*”

OP-17-51
cont.

Comments on Proposed Rule Standards

11. ARB has not demonstrated existing control technologies for compliance with the proposed rule requirements for reciprocating compressor rod packing vent stacks (i.e., 95% vapor control efficiency, $\text{NO}_x < 15$ ppmv at 3% O_2 , and no supplemental fuel gas in accordance with §95668(d)(4)(C) and §95668(c)(4)(B)), and the rule requirements should be revised to comport with the operational requirements of available external combustion equipment (e.g., use of supplemental fuel and/or achievable NO_x limits).

§95668(d)(4)(C) provides an option for rule compliance for reciprocating compressors, and requires that gas emissions from compressor vent stacks used to vent rod packing or seal emissions be controlled with the use of a vapor collection system as specified in section 95668(c). This option is not always viable and, therefore, the rule should be revised to consider the operational requirements of available external combustion equipment used to control emissions. This control requirement would be the only viable option for compressors where the captured emissions have the potential for entrained air (e.g., from a reciprocating compressor distance piece into which rod packing vents) and cannot be compressed into an existing sales gas or fuel gas system due to safety considerations. §95668(c)(4)(B) states:

OP-17-52

“If the vapor control device is to be installed in a region classified as non-attainment with, or which has not been classified as in attainment of, all state and federal ambient air quality standards, the owner or operator must install one of the following devices that meets all applicable federal, state, and local air district requirements:

1. A non-destructive vapor control device that achieves at least 95% vapor control efficiency of total emissions and does not result in emissions of nitrogen oxides (NO_x); or,
2. A vapor control device that achieves at least 95% vapor control efficiency of total emissions and does not generate more than 15 parts per million volume (ppmv) NO_x when measured at 3% oxygen and does not require the use of supplemental fuel gas, other than gas required for a pilot burner, to operate.”

ARB documents list Aereon Corporation as a provider of certified burners that meet this NO_x limit; however, the smallest thermal capacity for the Aereon burners is 0.17 MMBtu/hr, or 170 scf/hr for 1,000 Btu/scf natural gas as shown in Table 1¹. Reciprocating compressor rod packing leak rates greater than 2 scfm / 120 scf/hr require control, and a 120 scf/hr leak would require supplemental fuel to use the ARB-selected Aereon burners for emissions control. Further, rod packing does not leak at a steady rate – e.g., depends on compressor mode (i.e., operating or not-operating) and gas pressure and temperature – and the combustion control device would require supplemental fuel to

OP-17-53

¹ Certified Low- NO_x burner specifications provided by Phanindra Kondagari, Senior Process Engineer at Aereon Corporation on June 27, 2016.

assure proper air fuel ratio and low-NO_x operation. All of SoCalGas’s existing thermal oxidizers use supplemental fuel, which is critical to achieving low NO_x, particularly to control a variable flow of leaked gas that may or may not include entrained air. However, supplemental fuel gas is not allowed by the proposed rule. Thus, the ARB selected burners are not a viable control option. In sum, ARB has not demonstrated existing control technologies for compliance with the proposed rule requirements (i.e., 95% vapor control efficiency, NO_x < 15 ppmv at 3% O₂, and no supplemental fuel gas), and the rule requirements should be revised to comport with the operational requirements of available external combustion equipment (e.g., use of supplemental fuel and/or achievable NO_x limits).

OP-17-53
cont.

Table 1 Specifications for Aereon Corporation Certified Ultra-Low Emission Burners

Product	Max. Capacity (MMBtuH)	Min. Capacity (MMBtuH)
CEB-50	1.7	0.17
CEB-100	3.4	0.34
CEB-350	12.0	1.2
CEB-500	17.0	1.7
CEB-800	27	2.7
CEB-1200	40	4.0

12. §95668(e)(3) and §95669(b) should be revised to clarify that the dry seals on centrifugal compressors are not subject to the Leak Detection and Repair requirements of §95669.

Dry seals reduce emissions of high pressure gas from the compressor case along rotating shaft, but they leak slightly by design and do not completely eliminate the gas leak. Dry seal leak rate data from many sources show “normal” process emissions that could result in Method 21 leak concentration measurements exceeding the leak thresholds in §95669(h) and §95669 (i) (i.e., 10,000 and 1,000 ppmv as methane).

- Data compiled by Bylin et al² estimated that centrifugal compressor dry seal leak rates range from 0.5 to 3 scfm.
- Based on US EPA Natural Gas STAR recommended technologies and practices, ARB staff determined that 3 scfm is the average emission rate for a dry seal.³
- Gas turbine dry seal leak data produced by Solar Turbines estimates leak rates ranging from about 1 to 20 scfm depending on the compressor size, model and suction pressure.⁴

Revisions are needed to clearly indicate that normal process emissions from dry seals are not subject to LDAR requirements.

OP-17-54

² Bylin, Carey et al. “Methane’s Role in Promoting Sustainable Development in the Oil and Natural Gas Industry”, 24th World Gas Conference, in Buenos Aires, Argentina, October 2009

³ State of California Air Resources Board, Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, Staff Report: Initial Statement of Reasons, May 31, 2016

⁴ Solar Turbines Product Information Letter 251 “Emissions from Centrifugal Compressor Gas Seal Systems”, January 2013

13. §95669(e) should be revised as follows:

“Owners or operators shall audio-visually inspect (by hearing and by sight) all hatches, pressure-relief valves, well casings, stuffing boxes, and operating pump seals for leaks or indications of leaks at least once every ~~24 hours~~ **normal business day (i.e., excludes weekends and holidays)** for facilities that are visited ~~daily~~ **during each normal business day**, or at least once per calendar week for unmanned facilities;”

OP-17-54
cont.

14. ARB does not adequately justify the need for quarterly LDAR in §95669 because it relies on unsubstantiated source material. Historical results from an on-going O&G systems LDAR program that measures leak reductions indicate that annual surveys using a Method 21 gas leak concentration measurement (i.e., screening value) of 10,000 ppmv as a leak definition would result in emission reductions commensurate with or greater than the faulty assumptions used by ARB that are the basis for the proposed rule. A concern with annual LDAR programs is unabated large leaks, and this concern is alleviated by the proposed rule audio-visual inspection requirements that would ensure that large leaks that may develop (e.g., due to component or equipment failure) are discovered and addressed separate from the periodic survey.

OP-17-55

The need for quarterly LDAR is not adequately justified because it relies on unsubstantiated source material. As discussed below, annual surveys using a Method 21 gas leak concentration measurement (i.e., screening value) of 10,000 ppmv or more as a leak definition would result in emission reductions commensurate with or greater than the faulty assumptions used by ARB that are the basis for the proposed rule. §95669(g) requires that all components shall be tested for leaks of total hydrocarbons at least once each calendar quarter. Information provided by ARB in Appendix B: Economic Analysis indicates that ARB believes quarterly monitoring will result in a 60% reduction in gas leak emissions.

“According to the ICF Report, a quarterly inspection program is expected to reduce emissions by 60%.”

However, (1) this 60% reduction estimate appears to be an unfounded “circular reference” and there is no evidence that it is supported by actual measurement data; and (2) more reliable historical data from implementation of a multi-year O&G systems directed inspection and maintenance (DI&M) program (i.e., repair larger leaks and those that are cost effective to repair) indicates about 75 - 80% reduction is achieved using *annual* monitoring.

(1) The 60% reduction estimate appears to be based on a “circular” and unfounded reference and there is no evidence that it is supported by actual measurement data.

OP-17-56

The pertinent text is from page 3-10 of the ICF 2014 Report:⁵

“Research cited by both Colorado and EPA indicates that more frequent inspections result in greater reductions, summarized as approximately:

- Annual inspection = 40% reduction
- Quarterly inspection = 60% reduction

⁵ “Economic Analysis of Methane Emission Reduction Opportunities in the U.S. Onshore Oil and Natural Gas Industries,” ICF International, March 2014

Review of Proposed ARB Rule “Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities”

- Monthly inspection = 80% reduction”

These emission reduction data are not supported and highly questionable. Observations which make these data suspect include:

- In the Background Technical Support Document (TSD) for the Proposed Rule for Subpart OOOOa “Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015” of 40 CFR 60⁶, EPA referenced a Colorado Air Quality Control Commission (CAQCC) Economic Impact Analysis report for Regulation 7 to support the emission reductions expected from an OGI monitoring program:

“Based on this range of expected emission reductions as characterized by Colorado's Economic Impact Analysis, it is expected that an OGI monitoring program in combination with a repair program can reduce fugitive CH₄ and VOC emissions from these segments by 40 percent on an annual frequency, 60 percent on a semiannual frequency and 80 percent on a quarterly frequency”

- However, the CAQCC report⁷ references an unspecified EPA source for these reduction efficiencies:

“Based on EPA reported information, the Division calculated a 40% reduction for annual inspections, a 60% reduction for quarterly inspections, and an 80% reduction for monthly inspections.”

Neither EPA nor CAQCC provided data or rationale to support the assumed emission reduction efficiencies, and EPA changed the reduction efficiencies from CAQCC without explanation or further justification (i.e., an alternative, legitimate citation was not provided). Thus, there is no evidence in the referenced documents that these reduction efficiencies are based on actual measurements, and they appear to be based on circular references that were accepted by these regulatory agencies without verification or supporting data.

(2) More reliable historical data from implementation of an O&G systems DI&M program indicates about 75 - 80% reduction is achieved using annual monitoring.

A Canadian Association of Petroleum Producers (CAPP) 2014 document “Update of Fugitive Equipment Leak Emission Factors”⁸ estimates that upstream oil and gas equipment leak emissions have decreased about 75% since DI&M best management practices (BMP)⁹ were implemented (2007 and later). For the CAPP leak emission factors document and the BMP, an equipment component is generally deemed to be leaking if it produces a screening value of 10,000 ppm or

⁶ EPA-HQ-OAR-2010-0505-5120. Background Technical Support Document for the Proposed New Source Performance Standards 40 CFR 60, subpart OOOOa, August 2015.

⁷ EPA-HQ-OAR-2015-0216-0032. Colorado Air Quality Control Commission, *Initial Economic Impact Analysis for Proposed Revisions to Regulation Number 7 (5 CCR 1001-9)*. November 15, 2013.

⁸ EPA-HQ-OAR-2010-0505-4826. “Update of Fugitive Equipment Leak Emission Factors”, Canadian Association of Petroleum Producers (CAPP), February 2014.

⁹ “Management of Fugitive Emissions at Upstream Oil and Gas Facilities”, Canadian Association of Petroleum Producers (CAPP), January 2007.

OP-17-56
cont.

OP-17-57

OP-17-58

greater when screened in accordance with Method 21, or the emissions are detectable by a leak imaging infrared camera.

The BMP does not specify a leak detection survey frequency:

“Operators should develop a DI&M survey schedule that achieves maximum cost-effective fugitive emissions reductions yet also suits the unique characteristics and operations of their facility.”

However, the BMP does provide leak detection survey frequency guidance for various “leak-prone” equipment components. Annual surveys are listed for control valves, block valves, emergency vents, pressure relief valves (PRVs), and open-ended lines (OELs). Quarterly surveys are listed for compressor seals, pump seals, blowdown systems, and hatches and pressure-vacuum safety valves on tanks. Compressor seals are covered separately (i.e., not by the LDAR requirements) in the proposed ARB rule. Other components that are less “leak-prone”, such as flanges and connectors, would likely be surveyed annually (i.e., with the valves, PRVs, and OELs) or less frequently. Lacking actual data regarding the leak survey frequencies, a reasonable assumption would be that the majority of equipment components associated with the 75% emissions reduction was surveyed annually. This performance metric documented in a report and based on actual data indicates that an annual survey can achieve better performance than ARB hypothesizes for quarterly surveys. Thus, an annual survey frequency using a leak definition based on a Method 21 screening value of 10,000 ppmv is adequate.

This estimate of 75% reduction in leak emissions from oil and gas operations from annual monitoring is based on directly measured and estimated (e.g., from Method 21 screening values and associated emission factors) leak emissions encompassing multiple years using a DI&M approach, and was the most reliable and best supported estimate of LDAR emissions reductions found in the literature. LDAR programs, which require repair of all leaks (i.e., more leak repairs and nominally more reductions compared to a DI&M program), would be expected to have marginally higher reductions. Based on this CAPP data, 80% would appear to be a reasonable estimate of the control efficiency for an LDAR program with annual monitoring (albeit at a higher cost than DI&M). LDAR “summary papers” in the literature that conclude “all leaks” can be easily or economically repaired are essentially position papers that are ill-founded and based on erroneous assumptions. The discussion above is documented from the CAPP study and based on real, multi-year data from a leak mitigation program.

Measurement data comparing leak reduction efficiencies for LDAR or DI&M programs with various leak monitoring frequencies were not found, but performance improvements with more frequent surveys can be estimated. Leak reduction efficiencies for various typical leak monitoring frequencies can be estimated by assuming: (1) a linear leak rate growth with time; (2) that all detected leaks are repaired; and (3) a leak emissions reduction efficiency of 80% for annual monitoring. This implies, semiannual monitoring would incrementally reduce the annual monitoring emissions by half, for an overall annual control efficiency of 90% (incremental increase of 10% relative to annual monitoring). Similarly, quarterly monitoring would incrementally reduce the semiannual monitoring emissions by half, for an overall annual control efficiency of 95% (incremental increase of 5% relative to semiannual monitoring). Considering leaks that are unsafe to measure and delay of repair provisions for critical components, a quarterly monitoring emission reduction estimate of 90% may be more realistic. And, assuming a linear growth in leak rates likely over-estimates the incremental benefit from increased survey frequency. A concern with annual

OP-17-58
cont.

OP-17-59

LDAR programs is unabated large leaks, and this concern is alleviated by the proposed rule audio-visual inspection requirements that would ensure that large leaks that may develop (e.g., due to component or equipment failure) are discovered and addressed separate from the periodic survey.

OP-17-59
cont.

This analysis is consistent with leak survey monitoring frequency/reduction efficiency correlations estimated from data from the EPA Equipment Leaks Protocol document. These estimates show small incremental increases in leak emission reductions with more frequent monitoring, and indicate greatly diminished returns for leak monitoring more frequent than annual.

- 15. EPA Method 21 gas leak concentration measurements (i.e., screening values) have a very large uncertainty, are extremely poor predictors of gas leak rates, define a minimum leak definition concentration of 4,000 ppmv for many detectors, and should not be the basis for leak repair thresholds and schedules, and rule compliance determinations. The Proposed Rule’s LDAR provision should consider (1) the limitations of Method 21 and (2) that over 98% of gas leak mass emissions are from leaks from components with Method 21 screening values greater than or equal to 10,000 ppmv, and adopt a leak definition of Method 21 gas leak concentration measurement of 10,000 ppmv (as discussed in Comment 14) and remove Method 21 measured concentration-based rule requirements [e.g., §95669(h), (i), and (o)].**

Method 21 Limitations

§95669(g) requires that all components shall be tested for leaks of total hydrocarbons at least once each calendar quarter using EPA Method 21 with the detector calibrated with methane or an Optical Gas Imaging (OGI) instrument. The Allowable Number of Leaks (Table 1 and Table 3) and the Repair Time Periods (Table 2 and Table 4) are based on leak concentrations measured using Method 21. Method 21 leak concentration measurements (i.e., screening values) have a very large uncertainty, are extremely poor predictors of actual volumetric and mass leak rates, and should not be the basis for the Allowable Number of Leaks, Repair Time Periods, or other rule requirements (e.g., §95669(o)). The following data and discussion strongly support this assertion.

OP-17-60

- Figure 1 shows Gas Research Institute (GRI) data of measured gas leak rates at transmission sector sources as a function of Method 21 screening values, and shows that mass emission rates associated with a Method 21 leak concentration measurement can vary by 3 to 4 orders of magnitude. For example, for a Method 21 leak concentration measurement of about 10,000 ppmv, the measured mass emission rates ranged from less than 0.001 lb/hr to more than 1 lb/hr, a difference greater than three orders of magnitude. A similar range is observed at 1,000 ppmv, the other Method 21 leak concentration measurement threshold in the proposed rule.

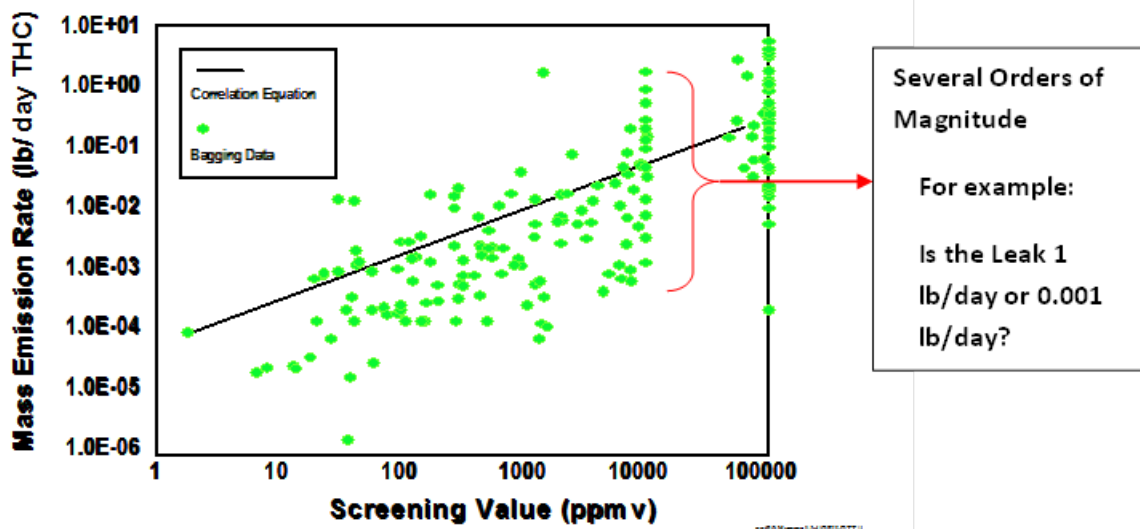


Figure 1. Leak rate versus concentration and correlation equation estimate.

- Similar scatter is observed in Method 21 leak concentration vs. measured leak rate data compiled by EPA to develop the EPA Protocol for Leak Emission Estimates (e.g., refer to Figures C-1 and C-2)¹⁰.
- These disparate mass emissions data are consistent with the qualification provided in Section 2.0 of Method 21:

“This method is intended to locate and classify leaks only, and is *not [emphasis added]* to be used as a direct measure of mass emission rate from individual sources.”

This qualification indicates that it is not appropriate to solely base compliance requirements on Method 21 leak concentration measurements, rather Method 21 leak concentration measurements should be more appropriately used as a screening tool to identify leaks for which quantitative measurements or other judgement regarding leak size should be applied.

- Section 6.4 of Method 21 specifies that the sample flow rate during leak concentration measurements shall be 0.10 to 3.0 l/min; thus, there is a factor of 30 difference between the lowest and highest allowable flowrates. Consequently, two different Method 21 leak detection instruments, operating at the low end and high end of the allowable flow rate range, would measure sample leak concentrations that differ by a factor of about 30.
- Section 6.3 of Method 21 specifies that “The scale of the instrument meter shall be readable to ± 2.5 percent of the specified leak definition concentration.” §95669(i) defines a leak to be a Method 21 measured concentration greater than or equal to 1,000 ppmv (as methane), and 2.5% of this value would be 25 ppmv or 0.0025%. Many commercially available gas detectors for methane have a detection limit of 0.01%, and would not meet the Method 21 specifications for measuring 1,000 ppmv leaks. The associated leak definition concentration would be 4,000 ppmv. Even though lower leak thresholds are in place in some jurisdictions (e.g., 500 ppmv for VOC rules that may utilize other detectors), it is not clear that ARB has identified leak detection

OP-17-60
cont.

OP-17-61

OP-17-62

¹⁰ EPA Protocol for Leak Emission Estimates, EPA-453/R-95-017, November, 1995.

equipment that can be used to demonstrate compliance with the 1,000 ppmv leak standard. To ensure accurate concentration measurements by leak detection instruments, the rule should clearly state that Method 21 leak detection instruments must comply with the requirements of Section 6.3.

OP-17-62
cont.

- Many Method 21 instruments have two detectors for accurate concentration measurements from 0 – 100%. For example, a low range (0 – 5%) catalytic detector and a high range (5 – 100%) thermal conductivity detector. A consequence of the two detectors is that measurement of concentrations near 5% (e.g., 4% - 6%) are very uncertain because it appears the instrument electronics can oscillate between the two detectors, and the instrument may get stuck on a 5% output. Thus, a 5% Method 21 leak concentration as an actionable threshold should be avoided due to the high uncertainty associated with these readings.

OP-17-63

- Section 7.1.2 of Method 21 provides a Calibration Gas specification:

“For each organic species that is to be measured during individual source surveys, obtain or prepare a known standard in air at a concentration approximately equal to the applicable leak definition specified in the regulation.”

OP-17-64

Some leak surveyors calibrate leak detectors with zero gas and 100% methane gas, and this calibration procedure would not be appropriate for leak definitions of 1,000 ppmv or 10,000 ppmv. To ensure accurate concentration measurements by leak detection instruments, the rule should clearly state that Method 21 leak detection instruments must be calibrated in accordance with Section 7.1.2 for the appropriate leak definition.

- The response of Method 21 instruments varies for different gas species (e.g., methane, ethane, propane), and the responses of the two detectors (i.e., catalytic detector and thermal conductivity detector) will differ for the same gas specie. Thus, variations in leaking gas stream compositions contribute to the uncertainty of Method 21 leak concentration measurements and the extremely poor leak concentration / leak rate correlation.

OP-17-65

- Section 8.3.1 of Method 21 provides general guidance for measurement of leak concentrations and generally requires placing the probe at the surface of the component interface where leakage could occur and moving the probe along the interface to find a maximum reading. The measured leak concentration will be impacted by the fraction of the leaking gas that is captured and the amount of sample dilution air. The dilution air rate will be impacted by the accessibility of the leak (e.g., impacted by the leak interface geometry), the angle of the probe opening (i.e., is sample air flow obstructed), and, as discussed above, the baseline instrument sample rate which can vary by a factor of 30.

OP-17-66

Table 2 summarizes Method 21 guidance for measuring leaks from different component types and discusses how component configuration can impact the leak measurement.

Table 2. Method 21 Leak Location Guidance for Various Components.

Component	Summary of M21 Leak Location Guidance (Section 8.3.1)	Notes
Valves	Most common source of leaks is the seal between the stem and housing – Also survey the interface of the packing gland take-up flange seat and the valve housings of a multipart assembly at interface surfaces where leaks could occur	Some interfaces and surfaces are difficult to access and can preclude complete leak capture
Flanges	Survey circumference of flange	– It can be difficult to isolate leaks on a flange circumference
Pumps and Compressors	Circumferential traverse at the outer surface of the pump or compressor shaft and seal interface. Position the probe within 1 cm of rotating shaft-seal interfaces. Housing configuration may prevent a complete shaft periphery traverse. Survey all housing joints and other leakage locations.	– Moving parts and inaccessible interfaces can preclude complete leak capture
Pressure Relief Devices (PRDs)	The configuration of most PRDs prevents sampling at the sealing seat interface. For PRDs equipped with an enclosed extension, or horn, place the probe near the center of the exhaust area to the atmosphere.	– Probes sampling near the center of an opening rather than the leak interface may not capture the entire leak – For components such as OELs or PRD’s with an extension / vent line, slowly leaking gas will completely fill the vent line tubing or piping. M21 samples that pull sample from the end of the extension will measure this residual gas and can over-estimate the leak concentration
Process Drains	For open drains, place the probe inlet near the center of the area open to the atmosphere. For covered drains, place the probe at the surface of the cover interface and conduct a peripheral traverse.	
Open-ended Lines or Valves	Place the probe inlet near the center of the opening to the atmosphere	
Seal System Degassing Vents and Accumulator Vents	Place the probe inlet near the center of the opening to the atmosphere	
Access door seals	Place the probe inlet at the surface of the door seal interface and conduct a peripheral traverse	– The Method 21 sample can pull gas that has accumulated inside the access door and this will not be representative of the leak rate occurring inside the access door (i.e., high bias to M21 leak concentration measurement)

Based on the information provided in Table 2, it is evident that different biases in Method 21 concentration measurements can exist for different component types, and that a single Method 21 concentration leak threshold should not apply for all types of components.

Over 98% of Gas Leak Mass Emissions are from Leaks from Components with Method 21 Screening Values Greater Than or Equal to 10,000 ppmv

OP-17-67

A review of the methane mass emission estimates from California oil and gas components in Table B-9 in the CARB EA shows that over 98% of the emissions are from leaks from components with Method 21 screening values greater than or equal to 10,000 ppmv. This indicates a less than 2% incremental increase in emission reductions for a leak definition of Method 21 gas leak concentration measurement of 1,000 ppmv versus 10,000 ppmv. These emissions (and potential reductions from LDAR) are based on emission factors from a 1999 CAPCOA document¹¹ which are listed in Table 3. The fourth column shows the ratio of the greater than / less than 10,000 ppmv emission factors, and the greater than 10,000 ppmv emission factors are generally three orders of magnitude larger than the less than 10,000 ppmv emission factors

OP-17-67
cont.

Table 3. CAPCOA O&G Components Leak Rate Emission Factors (Table IV-2c)

Component Type	(kgTHC/hr/source)		Ratio (> / <)
	Components > 10,000 ppm	Components < 10,000 ppm	
Valves	1.39E-01	3.50E-05	3,971
Connectors	2.59E-02	1.20E-05	2,158
Flanges	6.10E-02	2.80E-05	2,179
Open end lines	5.49E-02	2.40E-05	2,288
Pump Seals	8.90E-02	9.96E-04	89
Others (compressors, hatches, etc.)	1.38E-01	1.47E-04	939

These emission factors are supported by same component emission factors for the oil and gas industry from the EPA Protocol for Leak Emission Estimates and shown in Table 4. Note the similar greater than / less than 10,000 ppmv emission factors ratios in the fourth column.

Table 3. EPA Leak Protocol O&G Components Leak Rate Emission Factors (Table 2-8,)

Component Type	(kgTOC/hr/source)		Ratio (> / <)
	Components > 10,000 ppm	Components < 10,000 ppm	
Valves	9.80E-02	2.50E-05	3,920
Connectors	2.60E-02	1.00E-05	2,600
Flanges	8.20E-02	5.70E-06	14,386
Open end lines	5.50E-02	1.50E-05	3,667
Pump Seals	7.40E-02	3.50E-04	211
Others (compressors, hatches, etc.)	8.90E-02	1.20E-04	742

Thus, it is clear that the vast majority of O&G leak emissions are from components with Method 21 screening values greater than or equal to 10,000 ppmv, and the incremental emission reductions associated with a lower screening value leak definition (e.g., 1,000 ppmv) would be very small.

OP-17-68

CARB has not provided cost-effectiveness (i.e., \$/metric ton emissions reduction) calculations for the 1,000 ppmv screening value leak definition and the 10,000 ppmv screening value leak definition, or the cost-effectiveness of the incremental emission reductions for a 1,000, rather than 10,000, screening

OP-17-69

¹¹ CAPCOA, ARB. 1999. The California Air Resources Board Staff California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities.

July 15, 2016

Review of Proposed ARB Rule “Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities”

value leak definition. Considering the much lower leak rates (on average) for components with Method 21 screening values less than 10,000 ppmv, it would be expected that the cost to repair these leaks would be prohibitively high (i.e., very high \$/incremental mt of emissions reduction).

OP-17-69
cont.

Conclusion

For the reasons discussed above, it is clear that the same gas leak measured by different personnel and equipment could have very different Method 21 concentrations, and that the leak rate associated with a Method 21 concentration measurement has a very high uncertainty. This is reflected in the wide spread in the leak rate / leak concentration data presented in Figure 1 and the referenced figures in the EPA Protocol for Leak Emission Estimates. Method 21 gas leak concentration measurements are not an appropriate metric on which to characterize leak rates, determine thresholds for component repair period requirements, or to determine compliance with LDAR requirements. In conclusion, the ARB rule LDAR provision should consider the limitations of Method 21, the incremental cost-ineffectiveness of a 1,000 ppmv Method 21 screening value, and the documented leak mitigation performance objectives discussed in Comment 14, and adopt a leak definition of Method 21 gas leak concentration measurement of 10,000 ppmv and remove Method 21 measured concentration-based rule requirements [e.g., §95669(h), (i), and (o)].

OP-17-70

16. Tagging every critical component as required by §95670 is impractical, not necessary to comply with the intent of the proposed rule, an inefficient use of resources, and presents a safety hazard by obstructing and interfering with operator access to equipment, and as a potential fire hazard. If critical component tagging is included in the rule, it should be limited to a tag on the last critical component on each inlet and outlet stream (e.g., pipe or tubing) to the critical process unit. These tags would clearly demark the boundaries of the critical process unit and critical components, and would not require a multitude of tags all over industrial process equipment.

§95670 requires that owners or operators maintain “a record of *all* [*emphasis added*] critical components at the facility”, and that “*each* [*emphasis added*] critical component must be identified using a weatherproof, readily visible tag.”

Tagging *each* critical component is not practical, not necessary to comply with the intent of the proposed rule, and an inefficient use of resources. Further, tagging every component presents a safety hazard by obstructing and interfering with operator access to equipment, and could present a fire hazard. For example, if every component (e.g., connector, etc.) requires a tag for a critical gas-fired engine and associated reciprocating compressor, there would be hundreds of tags in the vicinity of hot surfaces and moving parts. The tags could pose an additional safety issue by being an unnecessary distraction for operators working in potentially hazardous conditions (e.g., during major repair operations). If critical component tagging is included in the rule, it should be limited to a tag on the last critical component on each inlet and outlet stream (e.g., pipe or tubing) to the critical process unit. These tags would clearly demark the boundaries of the critical process unit and critical components, and would not require a multitude of tags all over industrial process equipment.

OP-17-71

Maintaining a record of *all* critical components is not practical, not necessary to comply with the intent of the proposed rule, and an inefficient use of resources. Recordkeeping should be limited to include each critical process unit and a list of the associated tagged critical components demarking the boundaries of the critical process unit.

Table A3 in Appendix A should be modified accordingly.

17. Table 2 and Table 4 should be revised to indicate up to 12 months is allowed for repair of critical components, which is consistent with the time allowed in §95669(h)(3) and (i)(4).

For LDAR, §95669(h)(3) and (i)(4) specify the maximum time allowed for repair of critical components, and up to 12 months is allowed. This is a revision from earlier versions of the Proposed Rule that indicated 180 days, and SoCalGas supports the longer timeframe. However, ARB omitted analogous revisions required in Table 2 and Table 4. For the “Repair Time Period” indicated in Tables 2 and 4, the line item for critical components should be revised to, “Next shutdown or within ~~180 calendar days~~ **12 months**.”

OP-17-72

18. Natural gas utilities under the jurisdiction of the CPUC should not be required to receive approval by the ARB Executive Officer or other entities for their critical process units and associated critical components. Utilities should be allowed to submit documentation showing the processes that will utilize the critical component exemptions to maintain a safe and reliable natural gas system.

Under the jurisdiction of the California Public Utilities Commission (CPUC), both SoCalGas and SDG&E are providers of an Essential Public Service. The primary functions are intrastate natural gas transport and to “withdraw” previously stored gas to meet customer needs. As such, natural gas underground storage and transmission station operations are vital to the utility’s ability to reliably supply the markets at times of varying demand.

The Proposed Rule requires identification, documentation, and pre-approval of critical components in order to extend repair timeframes. This may result in a conflict between complying with the regulations governing a public utility and this regulation. ARB should seek to balance critical operational, cost and safety demands with timely leak repair activities.

OP-17-73

As an example of this need for balance, excerpts from SB1371 (Leno) Natural Gas Leakage Abatement contain language that address both environmental needs with and operational and safety concerns:

SECTION 1

“The Legislature finds and declares all of the following: (a) The Legislature has established that safety of the natural gas pipeline infrastructure in California is a priority for the Public Utilities Commission and gas corporations, and nothing in this article shall compromise or deprioritize safety as a top consideration.”

Article 3. Methane Leakage Abatement

“(b) With priority given to safety, reliability, and affordability of service, the commission shall adopt rules and procedures governing the operation, maintenance, repair, and replacement of those commission-regulated gas pipeline facilities...”

We believe that allowing public utilities to manage their systems that determine what are critical processes will balance the need for safe and reliable gas delivery to our customers with the necessity to further reduce methane emissions.

Therefore, we suggest the following change:

§95670

July 15, 2016

Review of Proposed ARB Rule “Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities”

(a)(1)

Natural gas utilities are not required to receive approval by the ARB Executive Officer or other entities for their critical process units and associated critical components. Utilities must submit documentation showing the processes that will utilize the critical component exemptions to maintain a safe and reliable natural gas system. Natural gas utilities are exempt from the remainder of this section.

OP-17-73
cont.

Attachment D: Proposed Regulation Wells Applicability

For Storage Wells, ARB Should Clearly Indicate that Standards in §95668(b) for Circulation Tanks and §95668(g) for Liquids Unloading Do Not Apply. Applicability of §95668(h) for Well Casing Vent Measurement Should Also Be Clarified.

The Proposed Regulation frequently refers to “well” related requirements without clearly indicating whether the applicable source is production wells, storage wells, or both. As currently drafted, definitions, other rule requirements, background materials, and other cited documents need to be reviewed to determine applicability. ARB should improve clarity by revising the Proposed Regulation to refer to the specific well type. For example, the definition of “Well” in §95667(a)(67) broadly includes production wells and underground storage wells, so additional review is needed to determine applicability or exclusions for storage wells. As explained below, review of the Proposed Regulation indicates that §95668(b) and (g) standards do not apply to storage wells. It appears that well casing vent measurement requirements in §95668(h) may apply to storage wells. However, the Proposed Regulation should be revised for all three of these standards to more clearly indicate applicability and avoid confusion when the rule is implemented.

§95668(b) – Circulation Tanks for Well Stimulation Treatments

For storage wells, applicability of §95668(b) is not immediately evident. Based on the following, SoCalGas concludes that this standard does not apply to storage wells:

- “Well stimulation treatment” traditionally refers to processes to improve gas flow from *production* wells, and a definition is included at §95667(a)(65).

“Well stimulation treatment” means the treatment of a well designed to enhance crude oil and natural gas production or recovery by increasing the permeability of the formation and as further defined by the Division of Oil, Gas, and Geothermal Resources SB 4 Well Stimulation Treatment Regulations, Chapter 4, Subchapter 2, Article 2, section 1761(a) (December 30, 2014).”
- The description refers to natural gas *production*, and storage wells are not mentioned. However, excluding storage wells based solely on the definition is not obvious. For example, storage well clean out and maintenance is conducted, and the proposed definition does not clearly exclude those activities.
- The well stimulation definition refers to DOGGR regulations,¹ which provide additional insight.
- The DOGGR rule Final Statement of Reasons² indicates, “Public Resources Code section 3157 defines the term ‘well stimulation treatment’...,” and notes the intent to clarify whether specific types of operations do or do not meet the definition. The definition in PRC Section 3157(a) and (b) follows:

“(a) For purposes of this article, “well stimulation treatment” means any treatment of a well designed to enhance oil and gas production or recovery by increasing the permeability of the formation. Well stimulation treatments include, but are not limited to, hydraulic fracturing treatments and acid well stimulation treatments.

OP-17-74

¹ Division of Oil, Gas, and Geothermal Resources SB 4 Well Stimulation Treatment Regulations, Chapter 4, Subchapter 2, Article 2, section 1761(a) (December 30, 2014).

² SB 4 Well Stimulation Treatment Regulations, Final Statement of Reasons (December 2014).

(b) Well stimulation treatments do not include steam flooding, water flooding, or cyclic steaming and do not include routine well cleanout work, routine well maintenance, routine removal of formation damage due to drilling, bottom hole pressure surveys, or routine activities that do not affect the integrity of the well or the formation.”

- Because they are excluded in section (b), well maintenance and cleanout to maintain the integrity of underground storage wells do not meet the definition of “well stimulation treatment.” Thus, SoCalGas concludes §95668(b) is not applicable to storage wells. For clarity, this should be indicated in the Proposed Regulation by revising the section’s title to “Circulation Tanks for **Production** Well Stimulation Treatments.” Alternatively, the definition at §95667(a)(65) could be revised to clearly indicate that storage wells are excluded.

OP-17-74
cont.

§95668(g) – Liquids Unloading of Natural Gas Wells

Similarly, applicability of §95668(g) should be clarified for storage wells. The rule text and definitions do not clearly indicate applicability, but ARB support documents indicate that §95668(g) applies to production wells. For example, the Draft Environmental Analysis (at page 23) describes the affected process as production wells:

“Over time, natural gas wells accumulate liquids that can impede and sometimes halt gas production. When the accumulation of liquid results in the slowing or cessation of gas production, removal of fluids (e.g., liquids unloading) is required in order to maintain production.”

OP-17-75

The description refers to gas *production* three times, and storage wells are not mentioned. The Staff Report (Initial Statement of Reasons) also includes background, “in plain English,” in Section II.B. The background on Liquids Unloading in subsection (1)(b) describes a process for production wells and does not mention storage wells. ARB should clearly indicate that §95668(g) is not applicable to storage wells. The rule could be revised to indicate §95668(g) applies to, “Liquids Unloading of Natural Gas **Production** Wells.” Alternatively, the definition of “liquids unloading” at §95667(a)(28) could be revised to clearly indicate that storage wells are excluded.

§95668(h) – Well Casing Vents

Applicability of the standard for well casing vents is less clear than the two sections discussed above. The proposed rule requires operators of wells with a well casing vent open to the atmosphere to measure the natural gas flow rate from the well casing vent annually, retain records, and report to ARB annually. There is not information available within the Proposed Regulation or background documents to ascertain whether storage wells are excluded. Thus, it appears that §95668(h) may apply to storage wells.

OP-17-76

Similar to the clarification requested above, ARB should clarify applicability of §95668(h). In addition, the rule should indicate that this vent line is not applicable to LDAR.

Attachment E: Agency Regulations

A. Pending Agency Rulemakings and Proceedings Have the Potential to Substantively Overlap with ARB's Proposed Regulations

Currently, at least six other agencies have proposed rulemakings, promulgated regulations, or issued advisory opinions regarding GHG emissions from the oil and gas sector. If each agency were to adopt such rules, continuous compliance would become exceptionally difficult for regulated parties. Operations personnel at affected facilities would have to reconcile their monitoring and reporting activities with every aspect of each regulation's many requirements, which at this point appear very unlikely to be wholly consistent. SoCalGas acknowledges and sincerely appreciates that ARB has been coordinating and/or consulting with other agencies during the preparation of their respective regulations, in particular ARB's assurance that DOGGR's storage facility monitoring requirements will not overlap with this proposed rule. SoCalGas urges that ARB continue to work with other agencies with the goal of synching regulatory requirements to the greatest extent feasible. Currently, however, each agency is poised to either implement or phase in its regulations at different times. These substantive and temporal inconsistencies create inefficiencies by requiring affected facility operators to continuously update their practices and compliance procedures.

The current agency actions include:

- **U.S. Environmental Protection Agency Greenhouse Gas Reporting Program.** On January 29, 2016, EPA proposed revisions and additional confidentiality determinations for the petroleum and natural gas systems source category of the GHGRP.¹ In particular, EPA is proposing to add new monitoring methods for detecting leaks from oil and gas equipment for petroleum and natural gas systems consistent with recently adopted new source performance standards (40 CFR 60, Subpart OOOOa, adopted June 3, 2016) for the oil and gas industry. The proposed GHGRP amendments are aimed at allowing facilities to consistently demonstrate compliance with multiple EPA programs. EPA also is proposing to add emission factors for leaking equipment to be used in conjunction with these monitoring methods to calculate and report GHG emissions resulting from equipment leaks. Further, EPA is proposing reporting requirements and confidentiality determinations for nine new or substantively revised data elements. These reporting requirements will be directed at facilities conducting equipment leak surveys. The facilities will begin reporting emissions using a specific leak survey methodology, and will additionally report the number of leaking components, and the average time the components were assumed to be leaking.
- **U.S. Environmental Protection Agency Methane Challenge.** For existing sources, EPA also is implementing a voluntary methane reduction program known as the Methane Challenge program, and EPA announced initial members

¹ See 81 Fed. Reg. 4987-5006 (Jan. 29, 2016), available at <https://www.gpo.gov/fdsys/pkg/FR-2016-01-29/pdf/2016-01669.pdf>.

in March 2016. EPA has sought consistency with the GHGRP to avoid duplicative, conflicting, or confusing requirements for existing reporters. Founding Methane Challenge program participants are committing to incorporate specific “Best Management Practices (BMPs)” over the next 5 years. In comments provided by SoCalGas/SDG&E on the proposed program, it was noted that California facilities will be subject to myriad methane reduction regulations that could possibly undermine the voluntary effort. Potential participants may be reluctant to commit to the program and make investments in equipment, information management systems, recordkeeping, or employee training only to find that state requirements (promulgated sometime later) compel them to employ conflicting reduction measures. Feedback from EPA to our comments indicates that EPA does not intend to inadvertently create a disincentive from voluntary program participation.

- **U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration Advisory Bulletin.** On February 5, 2016, the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (“PHMSA”) published an advisory bulletin directing all owners and operators of natural gas underground storage facilities to check for leaks in wellheads and pipelines, verify that shutoff valves and other safety equipment are in working order, and verify that the pressure used to force gas underground does not exceed the design limits of the underground reservoir or the associated equipment.² The bulletin also directs operators to update their emergency plans.

Congress recently passed the PIPES Act of 2016, which President Obama signed on June 22, 2016. Among other things, the Act includes:

- **Section 12 – Underground Gas Storage Facilities:** Within two years of passage, requires PHMSA to issue minimum safety standards for underground gas storage facilities. This section also imposes a “user fee” on underground gas storage facilities as needed to implement the safety standards.
- **Section 16 – PHMSA Authority to Issue Emergency Order if “Imminent Hazard”:** To address an imminent hazard, the Secretary may issue an emergency order imposing emergency restrictions, prohibitions, and safety measures without prior notice or an opportunity for a hearing.
- **Section 31 – Aliso Canyon Task Force:** Codifies an Aliso Canyon task force that will issue a report within 6 months that will: (A) Analyze cause and contributing factors of the Aliso Canyon natural gas leak; (B) Analyze measures taken to stop the natural gas leak; (C) Assess impact of the natural gas leak on (i) health, safety, and the environment, (ii) wholesale

² See 81 Fed. Reg. 6334-6337 (Feb. 5, 2016), available at http://phmsa.dot.gov/pv_obj_cache/pv_obj_id_C7740235E7B8724D36AA2CF7EBAA18CAFC110300/filename/2016-02228.pdf.

and retail electricity prices, and (iii) the reliability of the bulk-power system; (D) Recommend how to improve (i) the response to a future leak, and (ii) coordination between all appropriate agencies; (E) Analyze potential for a similar natural gas leak to occur at other underground natural gas storage facilities in the United States; (F) Recommend how to prevent any future natural gas leaks; and (G) Recommend standards for Aliso Canyon and other facilities located in close proximity to residential populations.³

- **Senate Bill 1371.** In January 2015, the CPUC adopted an order instituting rulemaking (“OIR”) to reduce natural gas leakage consistent with Senate Bill (“SB”) 1371.⁴ SB 1371 requires the adoption of rules and procedures, in consultation with ARB, to minimize natural gas leakage from CPUC-regulated natural gas pipeline facilities. SB 1371 also requires gas corporations to file an annual report to the CPUC and ARB about their natural gas leaks and their leak management practices.⁵

Specifically, in implementing SB 1371, the CPUC must: (1) provide for the maximum technologically feasible and cost-effective avoidance, reduction, and repair of leaks and leaking components; (2) provide for the repair of leaks as soon as reasonably possible after discovery; (3) evaluate the operations, maintenance, and repair practices; (4) establish and require the use of best practices for leak surveys, patrols, leak survey technology, leak prevention, and leak reduction; (5) establish protocols and procedures for the development and use of metrics to quantify the volume of emissions from leaking gas pipeline facilities, and for evaluating and tracking leaks geographically over time; and (6) to the extent feasible, require the calculation of a baseline systemwide leak rate.⁶

ARB’s proposed regulations may potentially overlap with the SB 1371 OIR and ARB’s consultative role in that proceeding. As stated by SB 1371,⁷ the CPUC and ARB should ensure that the regulations and rules adopted by each agency are consistent. To facilitate such consistency and avoid imposing undue burdens on those subject to both sets of regulations, ARB should delay this rulemaking until the CPUC has completed its rulemaking. By refraining from issuing a rule until the CPUC has completed its process with ARB’s consultation, ARB would be reducing regulatory conflict.

- **Division of Oil, Gas, and Geothermal Resources Emergency Regulations.** In January 2016, DOGGR issued emergency regulations concerning natural gas

³ PIPES Act of 2016, Section 31, Task Force Report on Leak Cause and Recommendation.

⁴ See CPUC, Proceeding R-15-01-008, OIR (Jan. 22, 2015).

⁵ Cal. Pub. Util. Code § 975.

⁶ Cal. Pub. Util. Code § 975(e)(1)-(6).

⁷ Cal. Pub. Util. Code § 975(g).

storage facilities.⁸ These regulations, which became effective on February 5, 2016, require underground gas storage project operators to submit an inspection and leak detection protocol to DOGGR for review and approval by late February 2016. The protocol must include inspection of wellhead assembly and attached pipelines for each of the wells and the surrounding area within a 100 foot radius of each wellhead. The regulations mandate the use of “effective gas leak detection technology,” such as infrared imaging, at least once per day. The emergency regulations require the operator to take into consideration certain factors in deciding which leak detection technology to use, such as “detection limits, remote detection of difficult to access locations, response time, reproducibility, accuracy, data transfer capabilities, distance from source, background lighting conditions, geography, and meteorology.”

DOGGR’s emergency regulations also require operators of underground gas storage projects to submit a Risk Management Plan to DOGGR for review and approval. These plans must identify potential threats and hazards to reservoir and well integrity, evaluate the risks, identify risk mitigation processes, and establish a process for periodic review of the risk assessment process. Plans must include risk assessment and prevention protocols for: (1) mechanical well integrity; (2) corrosion monitoring and evaluation; (3) monitoring of wells and attendant production facilities for other risks including casing pressure changes, facility flow erosion, hydrate potential, etc.; (4) reservoir integrity demonstration procedures; (5) identification of potential threats and hazards to operation of project; and (6) prioritization of risk mitigation efforts.

In addition, DOGGR requires new monitoring and testing requirements for: annular gas; safety valves; master valves; wellhead pipeline isolation valves; reservoir pressure; and any additional requirements included in the risk management plan adopted.

On July 8, 2016, DOGGR issued Discussion Draft regulations applicable to underground gas storage projects. DOGGR has indicated that these regulations provide an opportunity for public comment prior to the formal rulemaking process, and will be refined into formal draft regulations to be considered through the state’s formal process for adopting new regulations. We understand that DOGGR intends to initiate the formal rulemaking process by the end of August 2016 and finalize the rulemaking by early 2017. The Discussion Draft regulations’ requirements for operators of underground gas storage projects are very similar to the emergency regulations and suggest that the requirements shall cease to apply if ARB adopts and implements its proposed regulation.

As indicated above, SoCalGas appreciates ARB’s efforts to coordinate with DOGGR to avoid regulatory overlap. However, we urge ARB to incorporate into

OP-17-77
cont.

⁸ DOGGR’s emergency regulations are available at <http://www.conservation.ca.gov/index/Documents/Underground%20Gas%20Storage%20Project%20Requirements%2c%20Text%20of%20Proposed%20Regulations.pdf>.

the proposed regulation the flexibility afforded by DOGGR's emergency regulations and Discussion Draft regulations.

- **South Coast Air Quality Management District Order for Abatement (Case No. 137-36): Condition 8 – Enhanced Leak Detection and Reporting Well Inspection Program; Condition 10 – Continuous Air Monitoring Plan; and Condition 11 – Public Notification.** While the Abatement Order is specific to the Aliso Canyon Storage Facility, it nonetheless further demonstrates the extent of regulatory overlap. The Abatement Order requires:

- SoCalGas to prepare an Enhanced Leak Detection and Reporting Well Inspection Program that provides for:
 - Daily inspections of all active and abandoned natural gas storage wells, water injection wells, and shallow zone oil production wells owned by SoCalGas at Aliso Canyon.
 - Infrared cameras or equivalent to utilize infrared technology to monitor SoCalGas natural gas wells located at the Facility property.
 - Monitoring and emissions measurements during well inspections
 - Prioritizing and conducting an enhanced well leak detection and reporting program based on criteria relevant to the risk of well leakage from the Facility, including maintenance, condition, age and/or emissions from wells.
 - Proactive identification and mitigation (i.e., repair) of potential emissions of air contaminants.
 - Enforceable commitments and timelines to accomplish the specified Program elements as quickly as feasibly possible.
- SoCalGas to provide the District with funding for District staff or contractor hired by the District, or a combination of the two, to develop, staff, and implement a continuous air monitoring plan, including a methane monitor network at the Facility property, for the nearby school/community during the duration of this Order. This continuous air monitoring plan is “independent from any other air monitoring plan being performed by SoCalGas, or in conjunction with any other agency.”
- An Air Quality Notification Plan providing for public notification of certain types of releases.
- Various types of recordkeeping (e.g., wells taken out of service or installed, well inspection and maintenance reports, daily infrared camera data).

OP-17-77
cont.

- **Bureau of Land Management/Department of the Interior Proposed Regulations.** The Bureau of Land Management (“BLM”) within the U.S. Department of the Interior (“DOI”) is proposing new regulations to reduce waste of natural gas from venting, flaring, and leaks during oil and natural gas production activities on onshore Federal and Indian leases. The proposed rules will require (1) oil and gas producers to adopt currently available technologies, processes and equipment that limits the rate of flaring at oil wells on public and tribal lands, (2) operators to periodically inspect their operations for leaks, and (3) replace outdated equipment that vents large quantities of gas into the air. Operators are also required to limit venting from storage tanks and use best practices to limit gas losses when removing liquids from wells.

OP-17-78

A. Pending Agency Rulemakings Should Be Coordinated in Advance of Implementation

Each of the above-referenced agency actions has its own unique timing for each phase of approval and implementation. We understand the ARB previously anticipated finalizing the regulation as early as September 2016. While the DOGGR emergency regulations were finalized and are being implemented more swiftly, ARB’s scheduled finalization date may occur before other agencies are able to finish their rulemaking processes. In any event, ARB and the other agencies identified herein should consider synchronizing the timing to enact proposed regulations to ensure that the regulations are consistent with one another and do not require duplicative actions.

OP-17-79

For example, DOGGR’s emergency regulations required owners and operators to submit a leak detection and inspection protocol to DOGGR for approval in February. DOGGR’s regulations also required owners and operators to start daily monitoring for the presence of annular gas in early March 2016. Owners and operators also were required to do “function testing” on all surface and subsurface safety valve systems in May 2016, and then every six months thereafter. Owners and operators also will be required to test the operation of master valves and wellhead pipeline isolation valves for proper function, and again annually thereafter. Finally, on August 5, 2016, owners and operators must submit a Risk Management Plan to DOGGR. To the extent ARB’s regulations ultimately require similar actions at later dates, regulated entities will be forced to conduct duplicative work at a cost that likely exceeds environmental or risk-reduction benefits.

OP-17-80

Other pending agency actions may prove instructive and should be fully evaluated by ARB before taking action. For example, EPA published a Notice⁹ requesting comment on a proposed Information Collection Request (ICR), which initiates the process for EPA to develop performance standards for *existing* sources in the oil and gas industry. That action will supplement the NSPS (Subpart OOOOa) adopted on June 3. Comments on EPA’s proposed rule were due on February 29, 2016. EPA also conducted an information-gathering phase, and requested industry participants to provide data on hazardous air pollutant emissions from the

OP-17-81

⁹ 81 FR 35763. EPA Notice, Proposed Information Collection Request; Comment Request; Information Collection Effort for Oil and Gas Facilities (June 3, 2016).

natural gas production, transmission and storage segments of the oil and natural gas sector.¹⁰ The EPA ICR will provide detailed information to assist EPA in its rulemaking process, and EPA envisions the information collection will be completed in March 2017. Therefore, it would be prudent for ARB to more closely assess compatibility with new source regulations (e.g., Subpart OOOOa), and “wait and see” how EPA’s existing source requirements will unfold before promulgating potentially duplicative or conflicting regulations. Under §111(d) of the Clean Air Act, EPA envisions the existing source rules will include a larger state role than NSPS, and that programmatic approach will be developed and proposed over the next 12 to 18 months.

OP-17-81
cont.

Similarly, the CPUC currently is accepting comments on Phase I issues regarding annual reporting requirements, best management practices, and cost-effectiveness considerations to implement SB 1371. The ARB has been actively involved in the CPUC’s SB 1371 OIR, including participation in extensive informal workshops and the CPUC’s staff proposal issued on January 26, 2016 regarding reporting requirements reflect ARB’s recommendations. The CPUC and ARB held a workshop on targets, compliance, and enforcement on April 12, 2016. Issuance of an ARB and CPUC staff proposal on targets, compliance, and enforcement was made on June 23, 2016, and will be followed by a comment period. This process could offer valuable insight and feedback to both the CPUC and ARB, which should be considered in any proposed rules to avoid unnecessary duplication.

OP-17-82

The CPUC is expected to issue a Phase I decision regarding SB 1371’s required natural gas leak abatement regulations in the fourth quarter of 2016. Additional rulemaking regarding ratemaking and performance-based financial incentives associated with the natural gas leak abatement program will follow in Phase II, although a specific timeline has not yet been established for that process. Given the potential for ARB’s and the CPUC’s requirements to overlap, however, SoCalGas suggests that ARB refrain from issuing a rule until the CPUC has completed at least the Phase I process.

Alternatively, ARB’s proposed phase-in period could be extended to ensure that its regulations are implemented in way that does not duplicate efforts required by other agencies. For example, BLM/DOI has proposed for its regulations to be phased in over several years to allow operators to make the transition more cost-effectively.

OP-17-83

If all of these proposed regulations are implemented at the same time or in rapid succession, it would create a logistical nightmare for affected entities. While the regulations may appear similar, it will take each agency and operator significant time and effort to figure out how each rule actually works in practice, and whether or not these perceived similarities are only superficial. For EPA’s existing source rule, specific criteria that are not yet defined will need to be addressed. Even if the substantive regulations were to be exactly the same, it is extremely inefficient to require the same information to be reported to different agencies in different formats. Therefore, rather than adding another patch to the current and growing patchwork of regulations governing CH₄ emissions from oil and gas facilities, SoCalGas requests that ARB

OP-17-84

¹⁰ 80 FR 74068. EPA Request for Information, Oil and Natural Gas Sector: National Emission Standards for Hazardous Air Pollutants (November 27, 2015).

refrain from pursuing additional regulations at this time and allow the processes of other agencies to more fully run their course.

Attachment F: GWP Reference Table by Governmental Program

GWP Reference Table by Governmental Program

Agency	Program/Policy/Regulation	IPCC Report Referenced	Methane GWP
EPA	Greenhouse Gas Reporting Program (Mandatory reporting)	AR4 except AR5 for those gases that did not have value in AR4 - both 100 yr.	25
EPA	Inventory of Greenhouse Gas Emissions and Sinks (Inventory)	AR4 - 100 yr.	25
EPA	Voluntary Methane Reduction Programs:	AR4 - 100 yr.	25
EPA	Natural Gas STAR Methane Challenge Program	AR4 - 100 yr.	25
EPA	AgSTAR	AR4 - 100 yr.	25
EPA	Global Methane Initiative	AR4 - 100 yr.	25
EPA	Coalbed Methane Outreach Program (CMOP)	AR4 - 100 yr.	25
EPA	Landfill Methane Outreach Program (LMOP)	AR4 - 100 yr.	25
ARB	Mandatory Reporting Regulation	SAR - 100 yr.	21
ARB	AB 32 Cap and Trade Regulation	SAR - 100 yr.	21
ARB	2014 Statewide GHG Emission Inventory	AR4 - 100 yr.	25
ARB	Low Carbon Fuel Standard	AR4 - 100 yr.	25



Michael J. Rubio
Manager, CA/OR/WA State Government Affairs

July 18, 2016

Mr. Jim Nyarady
Manager, Oil and Gas Section
California Air Resources Control Board
1001 I Street
Sacramento, CA 95814

Re: Draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Operations (June 2016)

Dear Jim:

Chevron U.S.A., Inc. (Chevron) is a California-based integrated oil and gas exploration and production company and is the largest oil and gas producer in California. We appreciate the opportunity to provide comments on the California Air Resources Control Board (ARB) draft Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Operations. Additionally, Chevron endorses and adopts the comments submitted by the Western States Petroleum Association (WSPA) on the proposed regulation.

Our concerns with the drafted language align with the comments and recommendations provided to the ARB by WSPA. We are primarily concerned with the technological and economic feasibility of the proposals related to gauge tanks and circulation tanks, as well as the lack of clarity of some of the definitions. Additionally, we are concerned with the duplication of inspections that would be created by the expansion of the LDAR program. As noted in WSPA's comments and recommendations, the final regulation should be improved to better align with existing local, state, and federal air quality regulations. We request that ARB consider WSPA's comments and recommendations for incorporation into the regulation, and that ARB continue to work with stakeholders to ensure that compliance with the final regulation is technically feasible and cost effective.

OP-18-1

Chevron is committed to working with the ARB as this process continues. Please contact Steve Arita (916-325-3000) for any follow up to these comments.

Sincerely,

July 18, 2016
 California Environmental Protection Agency
 Air Resources Board
 Byron Sher Auditorium
 1001 I Street
 Sacramento, California 95814

Dear Air Resources Board:

Thank you for accepting these comments submitted by Clean Air Task Force, Environmental Defense Fund, Natural Resources Defense Council and Sierra Club on Proposed Regulation Order 17 C.C.R. § 95665 et seq. (May 2016). We greatly appreciate the opportunity to comment on the California Air Resources Board's ("ARB") draft regulation for methane pollution from oil and gas facilities. These comments build upon recommendations that we submitted to ARB during its comprehensive stakeholder process and track closely recommendations that we made to ARB on the last draft, published February 19, 2016.¹

I. Introduction

We commend the ARB on proposing one of the strongest rules in the nation to curb the release of harmful emissions from oil and gas facilities. The draft regulation contains cost effective, technically feasible mechanisms that will achieve critically needed reductions in methane, a potent climate-altering pollutant, as well as important co-benefit reductions in volatile organic compounds (VOCs) and air toxics that pose serious threats to human health. ARB staff estimates the proposal will cut methane emissions from the over 51,500 oil and gas facilities in the state² by half³ while also removing 3,600 tons of VOCs and over 100 tons of air toxics from the atmosphere annually.⁴

OP-19-1

Significant methane reductions are necessary for California to reach its goal of reducing greenhouse gas emissions to 1990 levels by 2020, as ARB acknowledges.⁵ As ARB's Staff Report explains, such reductions "can have an immediate beneficial impact on climate change" due to the relatively short atmospheric life of methane.⁶

Requiring oil and gas owners and operators to capture rather than vent or leak methane emissions is one of the most cost-effective and sensible ways to achieve deep and immediate reductions in GHG emissions. Natural gas is primarily methane, and as ARB's draft proposal demonstrates, in many instances operators can benefit from the natural gas recovered either by sending it to sales or utilizing it onsite. Indeed, ARB's analysis demonstrates the proposal to be

OP-19-2

¹ Clean Air Task Force, et al., "Methane comments to CARB" (February 19, 2016).

² ARB Staff Report: Initial Statement of Reasons, 6 (May 31, 2016), available at <http://www.arb.ca.gov/cc/oil-gas/Oil%20and%20Gas%20ISOR.pdf>.

³ *Id.* at ES-2.

⁴ *Id.* at ES-4.

⁵ ARB, Proposed Short-Lived Climate Pollutant Reduction Strategy, 13 (April 2016), available at <http://www.arb.ca.gov/cc/shortlived/meetings/04112016/proposedstrategy.pdf>

⁶ *Id.* at 2.

highly cost effective at \$15 per ton of CO₂e reduced, considering savings.⁷ Even without accounting for the savings operators can achieve by capturing methane, the draft rules are still highly cost effective at \$17 per ton of CO₂e reduced.⁸ These numbers reflect only the direct benefits that accrue from the removal of 1.5 million metric tons of CO₂e from the atmosphere annually. When one considers that the implementation of the various clean air measures contained in the proposal will remove additional tons of VOCs and air toxics annually, it is clear that this proposal represents a very cost effective pathway to achieve much-needed reductions in harmful oil and gas emissions.

OP-19-2
cont.

Moreover, the state cannot rely on federal actions to achieve the greenhouse gas reductions required by legislative and gubernatorial mandates.⁹ US EPA rules adopted to date under the New Source Performance Standards program do not apply to existing oil and gas sources,¹⁰ and therefore will have no effect on the over 50,000 existing oil and gas wells in the state. While EPA has proposed requirements directed at reducing VOC emissions from a select number of onshore oil and gas facilities (control techniques guidelines, or CTGs),¹¹ these requirements are not final, and even once they become final, will have a limited effect on existing sources both in California and nationwide: the CTGs do not directly regulate methane, nor do they apply statewide (they only apply in parts of the state that are designated as moderate or above ozone nonattainment areas), and they do not apply to offshore facilities. Moreover, the proposed control techniques guidelines do not apply to many of the onshore facilities subject to the ARB proposal, including underground natural gas storage, transmission compressor stations, intermittent bleed pneumatic controllers or any facilities located in the storage and transmission segments. Accordingly, the proposed ARB rules are necessary to achieve critical reductions in methane, VOCs and air toxics that are left unaddressed by EPA requirements.

OP-19-3

For all of the above reasons we urge ARB to adopt the Proposed Regulation Order, 17 C.C.R. § 95665 et seq. (May 2016). However, in so doing, we respectfully request ARB to strengthen the rule in a few key ways, the basis for which we discuss in the remainder of our comments:

- Leak detection and repair (LDAR)
 - Provide operators with flexibility to seek approval for utilizing alternative leak detection methods for making inspections provided such methods are at least as effective in reducing waste and emissions as Optical Gas Imaging (OGI)-based LDAR and that the approval process is transparent and open to public participation.

OP-19-4

⁷ *Id.* at Table 14, 127.

⁸ *Id.*

⁹ Global Warming Solutions Act of 2006 (establishing statewide GHG emissions cap for 2020, based on 1990 emissions); *see also* ARB Senate Bill 605 (requiring ARB to develop a comprehensive plan to reduce emissions of short-lived climate pollutants); *see also* Short-Lived Climate Pollutant Reduction Strategy, *supra* note 5, discussing Governor Brown's announcement of a target for reducing GHG emissions to 40 percent below 1990 levels by 2030.

¹⁰ *See* 81 Fed. Reg. 35,824 (June 3, 2016).

¹¹ *See* 80 Fed. Reg. 56,577 (Sept. 18, 2015) (announcing availability of draft control techniques guidelines for VOCs from the oil and gas sector).

- Remove the provision in Section 95669 that allows operators to reduce the inspection frequency from quarterly to annual based on the percent or number of leaking components detected.
 - Require the repair of 500 ppm leaks detected during inspections.
- Underground natural gas storage
 - Expand daily screening or continuous monitoring provisions to include all wells in the field including but not limited to observation, monitoring, disposal, production and other wells.
 - Clarify that the monitoring requirements apply not only to active wells but also to idle and plugged and abandoned wells.
 - Clarify that the inspection requirements in Section 95668 are intended to apply in lieu of the inspection requirements in Section 95669.
- Pneumatic controllers and pumps
 - Phase out existing low-bleed continuous devices, and require quarterly testing of bleed rate during phase out period.
 - Prohibit or phase out the venting of emissions from intermittent-bleed pneumatic controllers; or, at a minimum, limit emissions from such devices to low bleed levels, and require operators to verify that emissions are at low-bleed levels via direct measurement.
 - Clarify that the pneumatic pump provision apply to glycol assist pumps, and ensure that methane emissions from these pumps are indeed controlled.
- Compressors
 - Expand the requirement to perform LDAR inspections to rod packing and seals on non-production reciprocating compressors.
 - Reduce the flow rate threshold from that triggers a repair or replacement of the rod packing or seals.
- Separator and tank systems
 - Tighten deadlines related to both commencement of annual flash analysis testing and installation of vapor collection systems.
 - Require owners and operators of separator and tank systems that receive less than 50 barrels of crude oil per day and that receive less than 200 barrels of produced water per day to conduct periodic flash analysis testing.
- Liquids unloading
 - Revise definition of “liquids unloading” to remove “use of pressurized natural gas.”
 - Require operators to keep personnel onsite when conducting manual liquids unloading activities.
 - Require reporting of an enhanced list of key parameters and conditions when emissions are vented during liquids unloading.

OP-19-4
cont.

In addition, while we commend ARB for recognizing the importance of accounting for the near term impacts of methane, we urge ARB to revise its assumptions to use the most recent IPCC AR5 20-year GWP for methane from fossil sources of 87. In supporting technical documentation and analyses for the rule, ARB assessed impacts and benefits of methane and

OP-19-5

methane reductions using the IPCC AR4 20-year GWP of 72. Using the most updated information available will ensure that the results of analytics for the rule are as accurate and representative of methane impacts as possible.

OP-19-5
cont.

II. Leak Detection and Repair

Frequent, comprehensive inspections of oil and gas facilities are a critical component of pollution prevention and mitigation. Direct measurement of emissions at a wide selection of oil and gas facilities across the country demonstrate that equipment malfunctions and poor maintenance can lead to significant pollution that is not represented in emission inventories. The direct measurement of scientific information demonstrates that oil and gas facilities are considerably leakier than industry reports, that operators do not and cannot predict when such failures will occur, and therefore, that frequent inspections with modern leak detection equipment are necessary to detect and promptly repair such leaks.

OP-19-6

Fortunately, modern leak detection equipment exists to quickly and accurately find leaks. Moreover, frequent – namely, quarterly – inspections are highly cost-effective. Such inspections remove harmful pollution from the atmosphere, while also ensuring a safer and more efficient workplace.

1. Field Studies Using Direct Measurement and Recent Incidents in California Demonstrate the Need for Frequent Instrument-Based Inspections: Significant Emissions May Emanate from Individual Components and Operations

Up until recently, regulators have relied nearly exclusively on emission inventories in order to understand the magnitude of a particular pollution problem as well as the potential reductions associated with a proposed solution. Now, however, recent advances in science have added to our knowledge and understanding of emissions from oil and gas facilities. These studies demonstrate that emissions are systematically significant and, at a select number of facilities, actual emissions are magnitudes higher than emission inventories suggest. These studies strongly support at least quarterly inspections using modern leak detection technology to identify leaking equipment. In some instances, repairs can be made instantaneously with the turn of a wrench. A number of studies, as well as industry reports, note that the gas savings associated with fixing such leaks cover the costs associated with repairing them.

OP-19-7

The first of these studies, conducted by an independent team of scientists at the University of Texas, found that emissions from equipment leaks, pneumatic controllers and chemical injection pumps were each 38 percent, 63 percent and 100 percent higher, respectively, than estimated in national inventories.¹² This study also found that 5 percent of the facilities were responsible for 27 percent of the emissions.¹³

¹² Allen, D.T., et al, (2013) “Measurements of methane emissions at natural gas production sites in the United States,” *Proc. Natl. Acad.* 2013, 110 (44), available at <http://www.pnas.org/content/110/44/17768.full>

¹³ See Allen, D.T., et al, (2014), “Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers,” *Environ. Sci. Technol.*, 2015, 49 (1), pp. 633–640 (referencing 2013 Allen study), available at <http://pubs.acs.org/doi/abs/10.1021/es5040156>.

Two follow-up studies, focused specifically on emissions from pneumatic controllers and liquids unloading activities at wells, found similar results.¹⁴ Specifically, the studies found that 19 percent of the pneumatic devices accounted for 95 percent of the emissions from the devices tested, and about 20 percent of the wells with unloading emissions accounted for 65 to 83 percent of those emissions. The average methane emissions per pneumatic controller were 17 percent higher than the average emissions per pneumatic controller in EPA's national greenhouse gas inventory.¹⁵

These findings were reiterated again in a series of direct measurement studies focusing on emissions from compressor stations in the gathering and processing segment and in the transmission and storage segment. The gathering and processing study found substantial venting from liquids storage tanks at approximately 20 percent of the sampled gathering facilities.¹⁶ Emission rates at these facilities were on average four times higher than rates observed at other facilities and, at some of these sites with substantial emissions, the authors found that company representatives made adjustments resulting in immediate reductions in emissions.

In the study on transmission and storage emissions, the two sites with very significant emissions were both due to leaks or venting at isolation valves.¹⁷ The study also found that leaks were a major source of emissions across sources, concluding that measured emissions are larger than would be estimated by the emission factors used in EPA's reporting program.

A recent helicopter study of 8,220 well pads in seven basins confirms that leaks occur randomly and are not well correlated with characteristics of well pads, such as age, production type or well count.¹⁸ That study used statistical models to assess the relationship of detection to well pad parameters such as age, well count, gas and oil production. The study found a weak relationship between site characteristics and detected emissions. The study focused only on very high emitting sources, given the helicopter survey detection limit, which ranged from 35 to 105 metric tons per year of methane. The paper reports that emissions exceeding the high detection limits were found at 327 sites. 92 percent of the emission sources identified were associated with tanks, including some tanks with control devices that were not functioning properly and so could be expected to be addressed through a leak detection and repair program. While the study did not characterize the individually smaller but collectively significant leaks that fell below the

OP-19-7
cont.

¹⁴ Allen, D.T. et al., "Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Liquid Unloadings," *Environ. Sci. Technol.*, 2015, 49 (1), pp 641–648, available at <http://pubs.acs.org/doi/abs/10.1021/es504016r>.

¹⁵ Allen, D.T., et al, (2014), "Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers," *Environ. Sci. Technol.*, 2015, 49 (1), pp 633–640, available at <http://pubs.acs.org/doi/abs/10.1021/es5040156>.

¹⁶ Mitchell, A.L., et al, (2015) "Measurements of Methane Emissions from Natural Gas Gathering Facilities and Processing Plants," *Environ. Sci. Technol.*, 2015, 49 (5), pp 3219–3227, available at <http://pubs.acs.org/doi/abs/10.1021/es5052809>.

¹⁷ R. Subramanian, et al, (2015) "Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol," *Environ. Sci. Technol.*, available at <http://pubs.acs.org/doi/abs/10.1021/es5060258>.

¹⁸ Lyon, et al., "Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites," *Environ. Sci. Technol.*, 2016, 50 (9), pp 4877–4886, available at <http://pubs.acs.org/doi/abs/10.1021/acs.est.6b00705>.

detection limit, it nonetheless confirms that high-emitting leaks occur at a significant number of production sites and that total emissions from such leaks are very likely underestimated in official inventories.

These studies demonstrate the importance of frequent inspections as well as the importance of comprehensive inspection requirements that apply to the full suite of components and equipment that can lead to leaks and unintentional venting. Specifically, certain components such as valves and connectors, may leak over time due to normal wear and tear. Other types of equipment, such as controlled storage tanks and pneumatic devices, may vent excess emissions when operating improperly. We commend ARB on drafting an LDAR provision that applies to both types of equipment. Under the proposal, operators must inspect controlled storage tanks, separators, vapor collection systems, circulation tanks, pneumatic devices and components such as valves and flanges on a quarterly basis using leak detection technologies. This is a critical aspect of the proposal as a comprehensive program coupled with frequent inspections is necessary to ensure operators detect all sources of unintentional leaks and venting.

OP-19-7
cont.

The heterogeneous, unpredictable and ever-shifting nature of equipment leaks suggest that frequent leak detection and repair is essential to help identify and remediate leaks. We therefore support the finalization of a quarterly, comprehensive inspection requirement in the rule.

2. Leading States and EPA Require Quarterly Inspections

Currently, five major oil and natural gas producing states require quarterly monitoring at oil and gas facilities. In addition, EPA recently finalized a quarterly inspection requirement for compressor stations. These existing requirements demonstrate that ARB's proposed quarterly inspection requirement is both reasonable and necessary in order for California to remain one of the leaders with respect to oil and gas emissions mitigation.

EPA has finalized a quarterly inspection requirement to detect methane and VOC leaks at compressor stations.¹⁹ Per the NSPS, operators may conduct such inspections using either optical gas imaging equipment or Method 21. Components found to be leaking 500 ppm or greater with a Method 21 instrument must be repaired.²⁰

OP-19-8

Colorado was the first state to promulgate comprehensive LDAR requirements aimed at reducing methane, as well as other pollutant emissions from a diverse suite of oil and gas facilities. Colorado's rules require operators to inspect for and repair hydrocarbon leaks, consisting of methane as well as other organic compounds, at three types of facilities: compressor stations, well sites and storage tank batteries. The rules require quarterly inspections at mid-sized facilities.²¹

¹⁹ 81 Fed. Reg. 35824, 35846 (June 3, 2016).

²⁰ *Id.*

²¹ 5 C.C.R. 1001-9, CO Reg. 7, §§ XVII.C.2.b.(ii), XVII F, (Feb. 24, 2014). Quarterly inspections are required at gathering sector compressor facilities with uncontrolled emissions between 12 and 50 tons of VOCs from equipment

Colorado provides operators flexibility in determining what type of leak detection equipment to use and whether or not to quantify a leak. Operators may use either an IR camera, Method 21, or “other Division approved instrument based monitoring device or method.”²² To date, the Division has approved one additional device, the Rebellion photonics camera. If an operator chooses to quantify a leak, they must fix all leaks with a hydrocarbon concentration of 500 ppm from components located at new and existing well sites and new compressor stations.²³ At older, existing compressor stations, the leak threshold triggering repair is 2,000 ppm.²⁴

Pennsylvania, the second largest shale gas producing state, requires quarterly inspections of all onshore gas processing plants and compressor stations in the gathering and boosting sector.²⁵ Like Colorado, Pennsylvania requires operators to inspect for and repair methane leaks as well as VOC leaks. Pennsylvania requires that operators utilize either a forward looking infrared camera (“FLIR”) or “other leak detection monitoring devices approved by the Department”.²⁶ Pennsylvania has also announced an intent to adopt a quarterly inspection requirement at new and existing well sites.²⁷

Ohio also requires quarterly inspections for hydrocarbon, including methane, leaks at unconventional well sites.²⁸ Per the Ohio requirements, operators may use either a FLIR camera or a Method 21 compliant analyzer. When using a FLIR camera, a leak is defined as any visible emissions. When using an analyzer, a leak is defined using a 10,000 ppm threshold for all components except compressors and closed vent systems, which use a 500 ppm threshold. Ohio has also proposed to require quarterly inspections at other facilities, including compressor stations.²⁹

Wyoming requires quarterly instrument-based inspections at all new and modified well sites in its Upper Green River Basin with the potential to emit 4 tons of volatile organic compounds from fugitive components,³⁰ and has proposed to require the same for existing well

OP-19-8
cont.

leaks and at well sites and tank batteries with uncontrolled emissions between 20 and 50 tons of VOCs from the largest condensate or oil storage tank onsite.

²² *Id.* at § XVII.A.2.

²³ *Id.* at § XVII.F.6.a,b.

²⁴ *Id.* at § XVII.F.6.a.

²⁵ Pa. Dep’t of Env’tl. Prot., General Permit for Natural Gas Compression and/or Processing Facilities (GP-5), Section G, http://www.dep.state.pa.us/dep/deputate/airwaste/aq/permits/gp/GP-5_2-25-2013.pdf

²⁶ PA GP-5, Section H.

²⁷ Pennsylvania DEQ, Oil and Gas Technical Advisory Board Meeting, Concepts for Proposed General Permit for Well Pads and Proposed GP-5 Modifications (Mar. 31, 2016), <http://files.dep.state.pa.us/OilGas/BOGM/BOGMPortalFiles/TechnicalAdvisoryBoard/2016/March%2031/Oil%20and%20Gas%20Presentation%20-%20Methane%20Reduction%20Stds.pdf>

²⁸ Ohio EPA, General Permit for High Volume Hydraulic Fracturing, Oil and Gas Well Site Production Operations, http://epa.ohio.gov/Portals/27/oil%20and%20gas/GP12.1_PTIOA20140403final.pdf.

²⁹ Ohio EPA, Draft Permits Available for Comment, *see* proposal for 18.1 Equipment/Pipeline Leaks, available at: <http://epa.ohio.gov/dapc/genpermit/permitsec.aspx>

³⁰ Wyoming Department of Environmental Quality, Oil and Gas Production Facilities Permitting Guidance (Sept. 2013), (WY Permitting Guidance) <http://deq.wyoming.gov/media/attachments/Air%20Quality/New%20Source%20Review/Guidance%20Documents/5-12-2016%20Oil%20and%20Gas%20Guidance.pdf>

sites and compressor stations in the Basin.³¹ Operators may use either Method 21 or an optical gas imaging instrument, or other approved instrument. Wyoming's rules and permit requirements are focused on reducing VOC and HAP emissions.

Utah requires quarterly instrument-based inspections at all new and modified well sites and tank batteries.³² Utah allows operators flexibility in determining which type of leak detection to use to conduct the inspections. Operators may use an IR camera, Method 21 or a tunable diode laser absorption spectroscopy. Utah requires operators of facilities that produce at least 25,000 barrels of crude oil and/or condensate to inspect on a quarterly basis. Operators of facilities that produce less than 25,000 barrels of crude oil and/or condensate must inspect annually. Utah requires that operators inspect components in hydrocarbon service, thereby requiring operators to detect and fix methane as well as VOC leaks.

OP-19-8
cont.

3. Quarterly Inspections Are Highly Cost Effective

Quarterly instrument-based inspections can remove significant methane, HAPs and VOCs from the atmosphere for very low costs. When considering the value of natural gas that can be sold to end users instead of being leaked into the air quarterly inspections simply make economic sense, and even more so when considering the co-benefits associated with reducing VOCs and HAPs. This is supported by ARB's analysis, which estimates that the LDAR provision can be achieved for a cost of \$15 per ton of CO₂e reduced assuming savings and \$17 per ton of CO₂e reduced not assuming savings.³³ Data from ICF, other states, LDAR service providers and companies similarly demonstrate that quarterly inspections are cost-effective:

- **ICF.** ICF developed a complex model to investigate the distribution of LDAR cost profiles at well sites. The results of the model indicate that the cost for LDAR using third-party OGI contractors ranges between \$491–793 per facility, depending on facility size.³⁴ Further, the analysis found that quarterly LDAR is cost-effective at \$258/metric ton of methane avoided for an average facility in the modeled distribution.³⁵
- **ICF** is also in the process of compiling a model that assesses the costs and cost-effectiveness of inspections using Method 21. This model also investigates the distribution of LDAR costs at facilities of varying size and emissions profiles. In addition, the model estimates costs over a period of three years, rather than simply looking at inspection costs in year one of an inspection program. The preliminary results of this model indicate that the cost for using third-party Method 21 contractors to

OP-19-9

³¹ Wyoming Department of Environmental Quality proposed changes to Air Quality Division Standards and Regulations, Nonattainment Area Regulations, Ch. 8, Sec. 6, (UGRB proposal) available at <http://sos.wy.state.wy.us/Rules/RULES/9868.pdf>; WY Permitting Guidance, 22.

³² GAO DAQE-AN149250001-14, II.B.

³³ ARB Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (May 31, 2016), <http://www.arb.ca.gov/regact/2016/oilandgas2016/oilgasisor.pdf>

³⁴ ICF Leak Detection and Repair Cost-Effectiveness Analysis, December 4, 2015. Figures reflect survey and equipment costs per facility.

³⁵ *Id.* Cost is \$10.32/MT CO₂e for an average facility in the distribution model, using a GWP of 25 and gas price of \$3/Mcf.

perform quarterly inspections at production facilities is \$8.58 per metric ton of CO₂e reduced.³⁶

- Rebellion. In comments at an EPA public hearing on the proposed NSPS in Dallas, TX, Rebellion Photonics, the maker of a leak detection technology, noted that its services are available for \$250 per site.³⁷ Rebellion noted that this cost is “turn-key,” including data management services.
- Colorado. Colorado’s economic analysis of its LDAR requirements assumed an hourly contractor rate of \$134 (reflecting a 30 percent premium).³⁸ Assuming a per-site survey time of four hours, this hourly rate yields a total per-site survey cost of \$536.³⁹
- EPA. EPA determined compressor station quarterly inspections to be cost-effective, estimating that the agency’s requirements would result in the reduction of 16,500 short tons of CH₄, 3,897 tons of VOCs, and 143 tons of HAPs at 525 compressor stations by 2020 at total annualized costs, including revenue from saved gas, of \$9,780,000.⁴⁰ For gathering and boosting compressor stations, this equates to \$685 per short ton of CH₄ reduced and \$234 per short ton of VOC reduced. For compressor stations in the transmission and storage sectors, this equates to \$251 per short ton of CH₄ reduced and \$9,072 per short ton of VOC reduced.
- EDF also contacted a number of third-party service providers and equipment rental firms, which provided costs that support the reasonableness of EPA’s determination. In particular, a FLIR presentation includes information from survey providers suggesting well-pad rates ranging from \$300 - \$800.⁴¹
- Noble and Anadarko submitted comments in response to the Colorado LDAR rule, stating that “the leak detection and repair requirements using instrument-based monitoring is [sic] a reasonable and cost effective way to reduce fugitive emissions at well production sites.”⁴² Additionally, the companies compiled a cost analysis for LDAR

OP-19-9
cont.

³⁶ Final results of the model and an accompanying report are forthcoming and will be submitted to ARB once final.

³⁷ Rebellion Photonics comments at the EPA hearing in Dallas, TX on September 23, 2015.

³⁸ Colorado Air Pollution Control Division, Final Economic Impact Analysis for Regulation Number 7, at 18.

Colorado assumed slight longer surveys, approximately 6.1 hours, yielding third party survey costs of approximately \$817.

³⁹ CDPHE Cost Benefit Analysis for Proposed Revisions to AQCC Regulations No. 3 and 7. Table 14: Instrument Based Tank Inspections Based on Proposed Tiering.

⁴⁰ EPA Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, Table 3-10, available at <https://www3.epa.gov/airquality/oilandgas/may2016/nsps-ria.pdf>.

⁴¹ FLIR, OGI Service Provider Survey, March 2016, at 2-3 (Attachment 2). The presentation notes additional charges for travel but also notes potential discounts for multiple well surveys.

⁴² Prehearing statement of Noble Energy, Inc. and Anadarko Petroleum Corporation in the matter of proposed revisions to Regulation Number 3, 6, and 7, available at

under the Colorado rule and found that, “Based on company-specific historic data and certain estimated values, Noble anticipates that LDAR monitoring at well production facilities would cost between approximately \$260 and \$430 per inspection...”⁴³

- According to a presentation delivered by Jonah Energy at the WCCA 2015 Spring Meeting, total LDAR program costs were about \$99 per inspection in the first year, decreasing to about \$29 per inspection in the fifth year.⁴⁴

4. *Incentivizing Innovation and Continuous Improvement in LDAR Technologies and Approaches*

Although frequent OGI and Method 21-based LDAR both offer feasible and highly cost-effective approaches to reducing leak emissions, advanced LDAR technologies – and protocols for using those technologies — are being swiftly developed and refined.

The methane leak detection technology landscape is highly dynamic, with innovation happening in real time, for example through ARPA-E's MONITOR project and EDF's Methane Detectors Challenge project in partnership with Shell, six other large producers and other stakeholders. It is crucial for new ARB rules to create space for innovative technologies, which may be able to deliver improved environmental performance at reduced cost. We strongly urge the agency to adopt a robust alternative compliance pathway that is minimally prescriptive and specifically creates an entry point for appropriately qualified/demonstrated methane selective and/or multiple hydrocarbon detecting approaches. Such an approach will help catalyze a race to the top in technology, reduce costs for the regulated community, and potentially boost environmental outcomes. We urge ARB to let operators choose from a list of approved devices, and to obtain approval from ARB for an equally effective device, rather than dictating technology in the rule. We note that ARB has proposed to allow operators of underground natural gas storage facilities to use screening instruments other than OGI or Method 21 to conduct inspections of wellheads and pipelines,⁴⁵ and that U.S. EPA included a pathway for operators to obtain approval to use innovative technologies to reduce fugitive emissions at well sites and compressor stations.⁴⁶

Accordingly, we encourage ARB to provide operators with flexibility to seek approval for alternative methods of complying with LDAR requirements, provided that these alternative

OP-19-9
cont.

OP-19-10

[http://ft.dphe.state.co.us/apc/aqcc/Oil%20&%20Gas%20201914-022314/PREHEARING%20STATEMENTS,%20EXHIBITS%20&%20ALTERNATIVE%20PROPOSALS/Noble%20Energy%20Inc%20&%20Anadarko%20Petroleum%20Corporation%20\(Noble%20&%20Anadarko\)/Noble%20and%20Anadarko%20PHS.pdf](http://ft.dphe.state.co.us/apc/aqcc/Oil%20&%20Gas%20201914-022314/PREHEARING%20STATEMENTS,%20EXHIBITS%20&%20ALTERNATIVE%20PROPOSALS/Noble%20Energy%20Inc%20&%20Anadarko%20Petroleum%20Corporation%20(Noble%20&%20Anadarko)/Noble%20and%20Anadarko%20PHS.pdf).

⁴³ Rebuttal Statement of Noble Energy, Inc. and Anadarko Petroleum Corporation in the matter of proposed revisions to Regulation Number 3, 6 and 7; Page 7, available at

http://ft.dphe.state.co.us/apc/aqcc/Oil%20&%20Gas%20201914-022314/REBUTTAL%20STATEMENTS,%20EXHIBITS%20&%20ALT%20PROPOSAL%20REVISIONS/Noble%20Energy%20Inc%20&%20Anadarko%20Petroleum%20Corporation/NOBLE_APC%20-%20REB.pdf

⁴⁴ WCCA Spring Meeting, Jonah Energy Presentation, May 8, 2015 delivered by Paul Ulrich.

⁴⁵ Proposed 17 C.C.R. Section 95668(i)(1)(B).

⁴⁶ 81 Fed. Reg. 35824, 35861 (June 3, 2016).

compliance options are at least as effective in reducing waste and emissions as OGI-based LDAR, and that the approval process is transparent and open to public participation.

OP-19-10
cont.

5. *ARB Should Remove the Frequency Adjustment Based on Percent or Number of Leaking Components*

Given the geographic and temporal unpredictability of leaking equipment discussed above, one of the most important aspects of an LDAR program is the frequency with which operators inspect facilities. ARB has proposed quarterly leak inspection surveys, with provisions to allow operators to reduce the frequency to annual inspections based on the percentage or number of leaking components found onsite. These provisions fall far short of what is necessary to protect public health and the environment, and lag behind what EPA, leading states and companies have already demonstrated in practice. Accordingly, we urge ARB to finalize a quarterly inspection requirement and to remove the provisions that allow operators to reduce inspection frequency to annual.

OP-19-11

The proposal creates perverse incentives by rewarding operators for failing to identify harmful leaks. EPA investigations at petroleum refineries and other types of facilities demonstrate this to be so. A 2007 report by EPA found “significant widespread non-compliance with [LDAR] regulations” at petroleum refineries and other facilities.⁴⁷ EPA observed: “Experience has shown that poor monitoring rather than good performance has allowed facilities to take advantage of the less frequent monitoring provisions.”⁴⁸ The report recommends that “[t]o ensure that leaks are still being identified in a timely manner and that previously unidentified leaks are not worsening over time,” companies should monitor more frequently.⁴⁹

OP-19-12

Furthermore, neither the percent nor number of leaking components is an accurate predictor of a facility’s emissions performance. At a conceptual level, if emissions from leaking components were homogenously distributed, the percentage of components leaking at a facility would be a good indicator of facility-level emissions. However, there is overwhelming evidence that leak emissions follow a skewed, highly-heterogeneous distribution, with a relatively few number of sources accounting for a large portion of emissions.

To estimate the extent to which the percent of leaking components correlates with a facility’s emissions performance, we empirically examined the effects of EPA’s proposed 1 and 3 percent thresholds using data from the City of Fort Worth Study Air Quality Study,⁵⁰ which includes both component level emissions information and site-level data. Figures 5 and 6 below show the results of this analysis. Figure 5 compares site-level emissions to the percentage of leaking components and demonstrates that the individual sites with the highest emissions fall below EPA’s proposed 1 percent threshold. Figure 6 aggregates site-level emissions at each of these

OP-19-13

⁴⁷ EPA, “Leak Detection and Repair: A Best Practice Guide,” October 2007, at 1, *available at* <http://www2.epa.gov/sites/production/files/2014-02/documents/ldarguide.pdf>.

⁴⁸ *Id.* at 23.

⁴⁹ *Ibid.*

⁵⁰ Eastern Research Group, Inc. and Safe Environmental Consulting, LP, “City of Fort Worth Natural Gas Air Quality Study: Final Report,” July 13, 2011, *available at*: http://fortworthtexas.gov/uploadedFiles/Gas_Wells/AirQualityStudy_final.pdf.

thresholds. Sites with less than 1 percent leaking components constituted over half of total emissions and over half of all sites. Conversely, there were no high-emitting sites with greater than 3 percent of their components leaking, and sites above a 3 percent threshold accounted for a small percentage of total emissions.

Figure 1: Site Methane Emissions (lb per year) Versus Percent Leaking Components

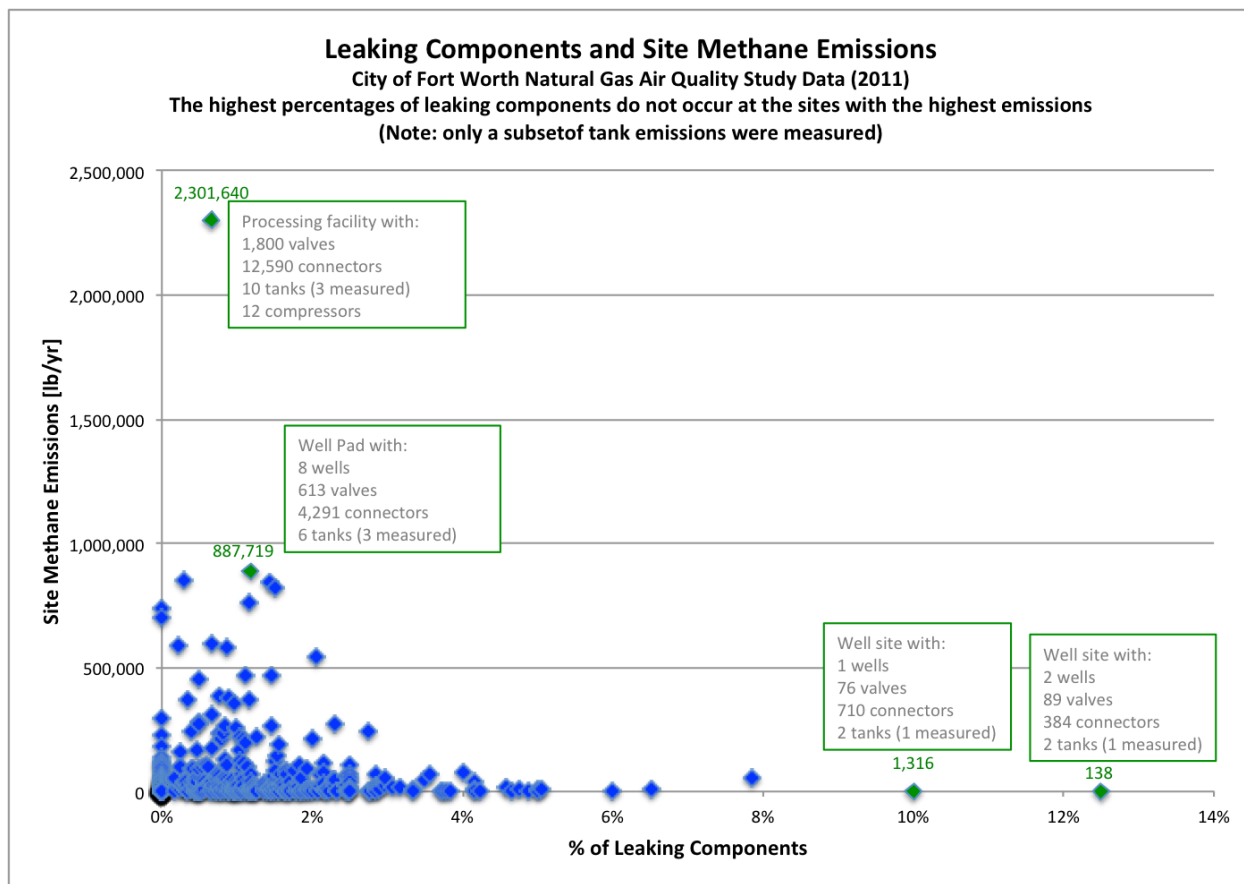
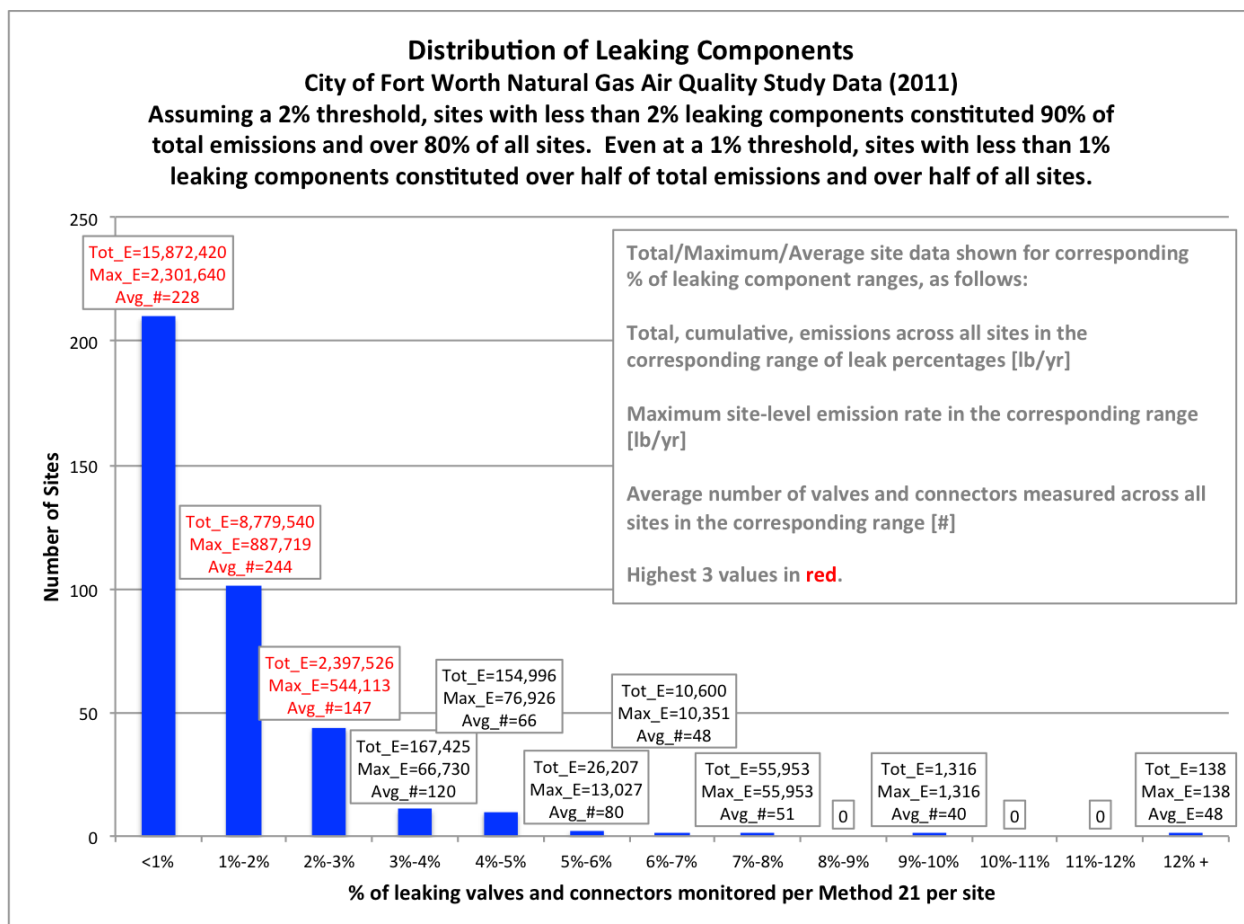


Figure 2: Number of Sites versus Percent of Leaking Valves and Connectors Monitored per Site (Method 21)



The number of leaking components is also a poor indicator of a facility's emission performance. To test this, we empirically examined the effects of BLM's proposed threshold using data from Allen, *et al.* (2013) and the Fort Worth Air Quality Study (2011),⁵¹ which include both component level emissions information and site-level data. Figures 3 and 4 below show the results of this analysis. Figure 3 shows the distribution of equipment leaks across the 150 production sites measured in the Allen, *et al.* (2013) study; sites with two or fewer leaks represented 70 percent of sites and constituted half of total methane emissions from leaks. Conversely, only 30 percent of sites had more than two leaks, representing only half of all emissions. In the Allen, *et al.* (2013) dataset, the site with the highest measured methane emissions from leaks had only two leaks but represented 18 percent of all emissions measured across all sites.⁵²

Figure 4 shows the distribution of leaks detected across the 388 sites measured in the Fort Worth Air Quality Study (2011); sites with two or fewer leaks represented 60 percent of sites and constituted 12 percent of total methane emissions from leaks. EPA reported in its Leaks White

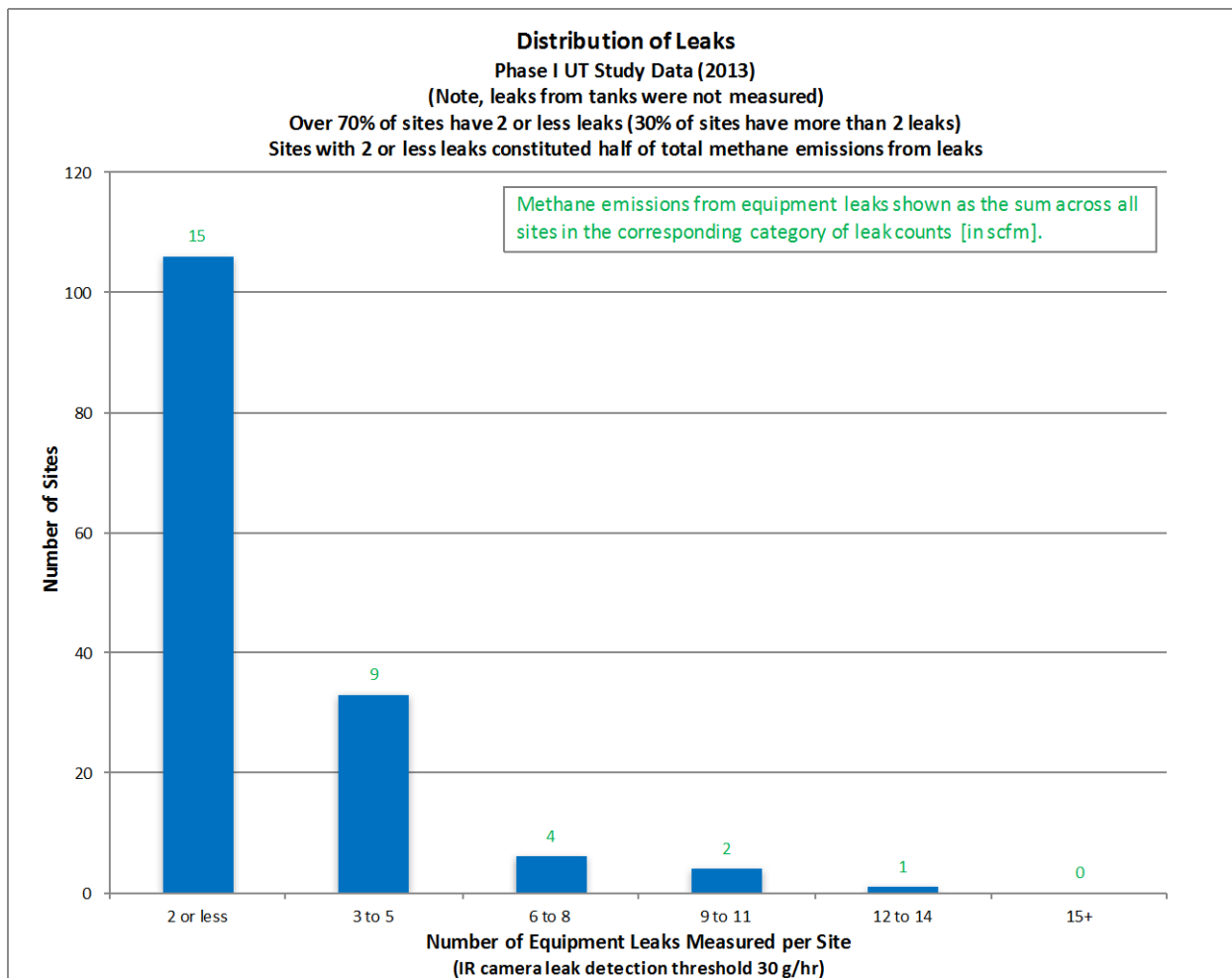
⁵¹ Fort Worth Study, Allen (2013)

⁵² One leaking separator vent was responsible for 5 scfm methane at this site.

Paper that the well data provided in the Fort Worth report showed: “At least one leak was detected at 283 out of the 375 well pads monitored with an OGI technology with an average of 3.2 leaks detected per well pad; The TVA detected at least one leak greater than 500 ppm at 270 of 375 well pads that were monitored with an average of 2.0 leaks detected per well pad.”⁵³ These data indicate that significant emissions can occur at sites with few measured leaks.

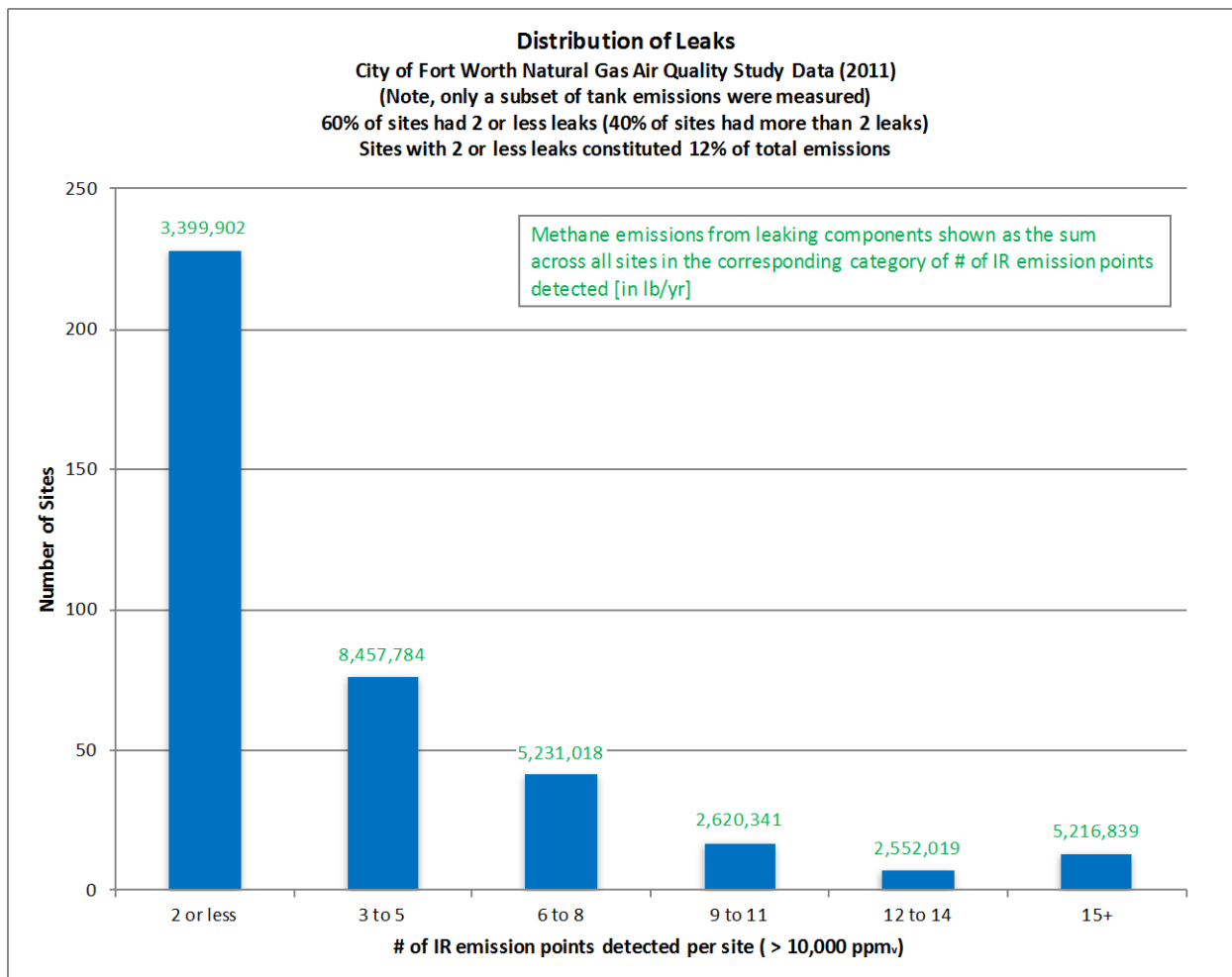
OP-19-14
cont.

Figure 3: Number of Sites versus Number of Equipment Leaks



⁵³ USEPA, “White Papers on Methane and VOC Emissions: Leaks,” available at <https://www3.epa.gov/airquality/oilandgas/2014papers/20140415leaks.pdf>

Figure 4: Number of Sites versus Number of Large Leaks



Other LDAR rules, and information submitted by stakeholders during such rulemakings, further underscore the need for ARB to finalize a flat quarterly inspection requirement.

EPA recently finalized inspection requirements for well sites and compressor stations. EPA’s final rules require operators to inspect compressor stations quarterly and well sites semi-annually. EPA removed a provision that appeared in the proposal that would have allowed operators to reduce the inspection frequency based on the percentage of leaking components identified during an inspection. As EPA noted, “most commenters opposed performance-based monitoring frequency” on the grounds that such an approach is “costly, time-consuming, and impose[s] a complex administrative burden for the industry and states.”⁵⁴

Colorado recently proposed, and ultimately adopted, a leak detection and repair requirement that requires operators inspect for leaks at all but the smallest sites on a continuous annual, quarterly, or monthly basis.⁵⁵ This proposal had the support of three large oil and gas

⁵⁴ 81 Fed. Reg. at 35857.

⁵⁵ 5 C.C.R. 1001-9, CO Reg. 7, §§ XVII.C.2.b.(ii), XVII F, (Feb. 24, 2014).

producers, Noble Energy, Anadarko Petroleum Corporation, and Encana. Notably, Encana submitted testimony regarding its own voluntary LDAR program, which requires monthly instrument-based inspections. According to Encana, “Encana’s experience shows leaks continued to be detected well into the established LDAR program.”⁵⁶ Viewed somewhat differently, Encana’s data suggests that while the largest reductions in VOC emissions occur in the first year of an LDAR program, significant emissions reductions are still being realized in subsequent years of the LDAR program.”⁵⁷

OP-19-15
cont.

Other information presented during the Colorado rulemaking further supports the need for frequent inspections over time. During the rulemaking, industry opponents of the Division’s proposal submitted data collected from their own LDAR monitoring experience. This data demonstrated an initial component leak rate frequency (before the first LDAR inspection) at new and modified gas processing plants of 1.7 percent.⁵⁸ The leak rate frequency falls to 0.4 percent after the first monitoring period and averages 0.3 percent over 12 consecutive calendar quarters. While it does support a decline after the first monitoring period, the data evidences a steady state of leak detection after that.

6. ARB Should Require All Leaks of 500 ppm be Repaired Upon Rule Implementation

The proposal sets the lowest leak threshold for the first year of the rule’s implementation at 10,000 ppm, and then lowers this to 1,000 in year two. A 10,000 ppm leak is a large leak, and we are not aware of any technical or other justification for allowing smaller leaks that can be detected to go unmitigated. Method 21 and OGI are both capable of detecting leaks smaller than 10,000 ppm. Moreover, other leading states with LDAR programs that contain quantitative leak thresholds such as Colorado and Pennsylvania require operators repair much smaller leaks of 500 ppm.⁵⁹ US EPA uses a leak threshold of 500 ppm for a number of LDAR requirements for new facilities under NSPS Subpart OOOO.⁶⁰ We therefore urge ARB to lower the initial leak threshold to 500 ppm to be consistent with these other states and to reflect what is technically feasible.

OP-19-16

III. Underground Natural Gas Storage Facility Monitoring.

We applaud ARB on proposing rigorous monitoring provisions at underground natural gas storage facilities. The recent leaks at Aliso Canyon and McDonald Island demonstrate the unpredictable nature of leaks and the potential for such leaks to cause very significant harm to

OP-19-17

⁵⁶ Rebuttal Statement of Encana Oil and Gas (USA) Inc., p. 10, Before Colorado Air Quality Control Commission, Regarding Revisions to Regulation Numbers 3,7 and 9, on file with EDF.

⁵⁷ *Id.* at 10-11.

⁵⁸ Prehearing Statement of WPX Energy Rocky Mountain, LLC’S AND WPX Energy Production LLC, Ex. A, Before Colorado Air Quality Control Commission, Regarding Revisions to Regulation Numbers 3,7 and 9, on file with EDF.

⁵⁹ 5 C.C.R. § 1001-9 XVII.F.6.b; Pa. Dep’t of Env’tl.

Prot., Air Quality Permit Exemptions, No. 275-2101-003, <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-96215/275-2101-003.pdf>.

⁶⁰ See 77 Fed. Reg. at 49490, 49498 (Aug. 16, 2016).

public health and the environment. The requirements that ARB has proposed will go a long way in ensuring that operators detect even small leaks immediately and repair them expeditiously.

OP-19-17
cont.

To address leaks from underground storage facilities, ARB has proposed a combination of ambient air monitoring and equipment monitoring. Specifically, operators must install a system capable of continuously monitoring the ambient air at the facility that can be accessed by ARB or local agencies.⁶¹ In addition, operators must perform either daily or continuous monitoring at wellheads, pipelines and the surrounding area within a 200 foot radius of the wellhead assembly.⁶² Operators must measure all leaks identified by the daily inspections or the continuous monitoring system in accordance with Method 21 (excluding the use of PID instruments) within 24 hours of detecting a leak, and repair all leaks measured above the thresholds specified in Section 95669 (the general LDAR provision) according to the timeframes specified in Section 95669.⁶³ Operators must notify ARB within 24 hours any time a leak is measured above the maximum leak threshold specified in Section 95669 or any time an air monitoring system detects levels of natural gas that exceed more than 10 percent of baseline conditions.⁶⁴ These provisions could be read as giving operators 24 hours from detection to measure a leak, and a subsequent 24 hours to report that measurement to ARB – in other words, two full days between detection and reporting. We therefore request that ARB clarify that operators must both measure any leak and report that measurement to ARB within 24 hours of detection, as we believe that this time frame is sufficient to accomplish both. The rule also requires operators to maintain records of leak measurements and submit an annual report containing leak measurement data.⁶⁵

OP-19-18

The proposal contains a number of provisions that are critical to reducing the environmental, public health and safety threats of underground natural gas storage facilities. In particular, we strongly support the continuous ambient air monitoring combined with the daily or continuous equipment monitoring requirements. These provisions go beyond the requirements that currently apply to surface leak monitoring at natural gas storage facilities under emergency rules promulgated by the Division of Oil, Gas and Geothermal Resources (DOGGR) in response to the Aliso Canyon leak,⁶⁶ and also beyond new rules proposed by DOGGR. Indeed, per the DOGGR proposal, the ARB requirements will supersede the DOGGR surface leak monitoring requirements if ARB finalizes requirements that are at least as stringent, or more stringent, than DOGGR's rules.⁶⁷ The current draft meets this test.

OP-19-19

⁶¹ 17 C.C.R. Section 95668(1)(i)(A).

⁶² *Id.* at Section 95668(i)(1)(B),(C).

⁶³ *Id.* at Section 95668(i)(3),(4).

⁶⁴ *Id.* at Section 95668(i)(6).

⁶⁵ *Id.* at Section 95668(i)(7),(8).

⁶⁶ DOGGR, Emergency Regulations 14 C.C.R. Section 1726 et seq., available at <http://www.conservation.ca.gov/index/Documents/DOC%202016-0126-03E%20Gas%20Storage%20Requirements%20-%20Final%20Text%20of%20Emergency%20Regulations.pdf>

⁶⁷ DOGGR, Discussion Draft 14 C.C.R. Section 1726.7(e), available at <http://www.conservation.ca.gov/dog/Documents/Public%20Discussion%20Draft%20-Requirements%20for%20Underground%20Gas%20Storage%20Proj.pdf>

We also support ARB’s proposal to provide flexibility to operators in choosing what type of leak detection technologies to use in performing the daily equipment inspections.⁶⁸ As we note in our comments on the general LDAR provision in Section 95669, we believe it is imperative that regulations incent or, at a minimum, allow for the use of emerging technologies, provided that there is a rigorous and transparent process whereby ARB can ensure that such technologies are at least as effective in detecting leaks as the methods explicitly allowed for in the rule. Along these lines, we urge ARB to issue clear guidelines that lay out the criteria for approval of “other screening instruments”⁶⁹ and provide an opportunity for public comment on any application to use an alternate screening instrument.

We support ARB’s proposal to require either daily screening or continuous monitoring of each natural gas injection/withdrawal wellhead assembly, attached pipelines and the surrounding area within a 200 foot radius of the wellhead assembly for leaks of natural gas; however, we request that this be expanded to include not just injection/withdrawal wells, but all wells in the field including but not limited to observation, monitoring, disposal, production and other wells, as leaks can occur from any of these well types. We also request that ARB clarify that the monitoring requirements apply not only to active wells but also to idle and plugged and abandoned wells. Given the age and long operating histories of California’s underground gas storage fields, monitoring all wells—not just active wells—is critical to detecting and stopping leaks. The Montebello and Playa Del Rey underground gas storage fields, for example, have long, documented histories of leakage from plugged and abandoned wells.⁷⁰

Lastly, it appears from the proposal that the inspection requirements in Section 95668 are intended to apply in lieu of the inspection requirements in Section 95669. However, this is not explicitly stated in the proposal. We suggest ARB clarify this in the final rule.

IV. Pneumatic Controllers and Pumps

Pneumatic equipment – natural gas driven pneumatic controllers and pneumatic pumps – are the source of enormous amounts of methane pollution. US EPA estimates that, nationwide, pneumatic equipment emitted over 3,100,000 metric tons of methane in 2014 – or 32 percent of estimated methane emissions from all oil and natural gas sources. As we describe below, cost effective technologies can essentially eliminate these emissions. We commend ARB for proposing strong standards for pneumatic equipment, but as we describe below, the proposed standards would still allow significant emissions from these types of equipment, and as such, ARB must strengthen the proposal.

ARB’s proposal:

⁶⁸ See *Id.* at Section 95668(i)(1)(B)(providing that operators may use Method 21, OGI or “other screening instruments”).

⁶⁹ *Id.*

⁷⁰ Chilingar, G. V., & Endres, B. (2005). Environmental hazards posed by the Los Angeles Basin urban oilfields: an historical perspective of lessons learned. *Environmental Geology*, 47(2), 302-317.

OP-19-19
cont.

OP-19-20

OP-19-21

- Prohibits venting of natural gas from any newly installed⁷¹ continuous-bleed pneumatic controller, regardless of the nominal bleed rate for the controller, and requires that all older continuous-bleed pneumatic controllers emit less than six standard cubic feet per hour (scfh), including provisions requiring operators to annually verify compliance with this limit with direct measurements of the rate of venting.

- Requires operators of intermittent-bleed pneumatic controllers to verify that these devices are not emitting natural gas between actuation as part of periodic leak-detection inspections.

- Prohibits venting of natural gas from pneumatic pumps.

No other state prohibits all venting from new continuous bleed devices or new and existing pumps located at the suite of facilities subject to this proposal, nor includes all pneumatic devices, including intermittent bleed devices, in leak detection and repair requirements. These provisions will go a long way towards reducing emissions from new continuous-bleed pneumatic devices and pumps, and improperly functioning intermittent and continuous-bleed devices and pumps. Joint commenters support these provisions.

Nevertheless, ARB's proposal will continue to allow significant pollution from pneumatic controllers. In particular, the proposal will allow "grandfathered" continuous-bleed controllers to operate indefinitely, provided that their emissions remain below six scfh. And, it will allow both new and existing intermittent-bleed controllers that vent to the atmosphere to continue operating - again, indefinitely. Allowing these polluting devices to remain in operation is not necessary because, as we detail below, cost effective technologies are available to eliminate, or at least greatly reduce, venting from pneumatic controllers. ARB must strengthen the proposal so that harmful methane emissions from pneumatic controllers do not continue unnecessarily.

1. Zero-Emitting Alternatives to Natural Gas-Driven Pneumatic Controllers are Available

A number of alternative technologies and approaches that can eliminate, or at least drastically reduce, venting of natural gas from pneumatic controllers are available and in-use today at oil and gas facilities in the United States and Canada. These technologies/approaches include:

- Using compressed "instrument air," instead of natural gas, to drive pneumatic controllers.
- Using electronic control systems and electric valve actuators, instead of pneumatic controller and valve actuators, for valve automation. As described below, this approach can be used both at sites where electricity is already available and at sites without power by installing solar powered systems.
- For some applications, pneumatic controllers are available that do not release gas to the atmosphere, but rather release gas to a pressurized gas line. These are typically referred to as "bleed-to-pressure" or "integral" controllers.

⁷¹ ARB's proposal would not allow venting from any continuous-bleed pneumatic controller installed after January 1, 2016.

OP-19-21
cont.

OP-19-22

- Gas released from pneumatic controllers can be routed to vapor collection systems (VCSs) or fuel lines.

Clean Air Task Force recently commissioned Carbon Limits to examine these and other alternatives to traditional, venting pneumatic controllers. Carbon Limits examined these technologies in detail, conducting numerous interviews with oil and gas producers who have utilized them and with suppliers of these systems. The first two technologies listed above, instrument air and electric systems, are inherently non-emitting technologies; Carbon Limits' research shows that these technologies are mature and proven, with successful installation at hundreds of sites in North America. Furthermore, Carbon Limits demonstrates that for almost any configuration of oil and gas facilities, at least one of these technologies is cost effective as a means of methane abatement as compared to unmitigated natural gas-drive pneumatic controllers.

OP-19-22
cont.

Instrument Air. Compressed air can be used instead of natural gas to drive devices. EPA's 2012 OOOO NSPS standards require all pneumatic controllers at processing plants to be zero emitting,⁷² and EPA presumes that most operators will use compressed "instrument air" systems to comply with this regulation.⁷³ Instrument air is a "well-established mature solution" to run pneumatic control systems and is in wide use globally. In fact, in some countries with significant oil production, instrument air systems are more common than natural gas-driven pneumatic controllers.⁷⁴

Instrument air systems offer several advantages over natural-gas driven pneumatic controllers, in addition to reduced emissions of methane and other pollutants in natural gas:

- Increased revenue from sales of natural gas that would otherwise be vented by gas-driven controllers.
- For many sites, instrument air systems can be simpler and cheaper to maintain. For gas-driven controllers, maintenance costs are significant if the gas at the site is wet (condensation of heavier hydrocarbons interferes with pneumatic controller operations) or sour. These costs are avoided with instrument air. Instrument air is very reliable; in contrast some sites with low gas-to-oil ratios may need to purchase natural gas or propane from offsite in order to ensure that sufficient gas is always available to drive pneumatic systems. These costs are all avoided with instrument air systems.⁷⁵

OP-19-23

For sites with 20 or more pneumatic devices, instrument air is a cost effective and feasible approach to eliminate emissions from all types of pneumatic controllers and pneumatic chemical injection pumps or heat trace pumps when electric power is available from the grid or from on-site generators. Oil and gas production in California occurs largely in areas with access to electric power. Many centralized production sites and compressor stations have numerous

⁷² 40 C.F.R. § 60.5390(b)(1).

⁷³ See EPA, TSD for the Proposed NSPS Subpart OOOO, 5-22 (July 2011).

⁷⁴ Carbon Limits, "Zero emission technologies for pneumatic controllers in the USA: Applicability and cost effectiveness" (2016) at 17.

⁷⁵ Carbon Limits at 18.

pneumatic devices. Retrofit of sites with instrument air is straightforward because operators can use existing pneumatic controllers and actuators with instrument air systems.

OP-19-23
cont.

Electric Systems. Gas-driven pneumatic controllers can now readily be replaced with electric systems at sites with and without electricity already available. These systems include electric valve actuators, electronic controllers, control panels and wiring, and—for sites without power available from the grid or from pre-installed on-site generators—solar panels and batteries.

These systems have become more mature and robust in recent years and are in use at hundreds of oil and natural gas production sites in the United States and Canada.⁷⁶ Operators report that these systems are reliable.⁷⁷ Like instrument air, these systems offer several advantages over natural-gas driven pneumatic controllers, in addition to reduced emissions of methane and other pollutants in natural gas, including:

- Increased revenue from sales of natural gas that would otherwise be vented by gas-driven controllers.
- Like instrument air, greater reliability and lower maintenance for sites with wet or sour gas, which degrades performance of gas-driven pneumatic controllers, or for sites where sufficient and steady supply of natural gas is not available.⁷⁸
- Easier and less expensive site level automation (for example, with Supervisory Control and Data Acquisition (SCADA) systems).⁷⁹ Installation of electric systems can greatly reduce costs for operators if they enable less frequent site visits. Furthermore, these systems can perform important functions such as shutting in wells in the event of large leaks, offering further environmental (and potentially health and safety) benefits. The value of these systems is recognized by ARB in the underground storage monitoring provisions of the proposed rules.

OP-19-24

Cost Effectiveness of Instrument Air or Electric Systems as Alternatives to Gas-Driven Pneumatic Controllers. Instrument air and electric systems are mature, reliable technologies. When electric controllers are combined with solar power systems, these non-emitting technologies are widely applicable.⁸⁰ Indeed, these technologies are widely used in California. Data from the ARB Oil and Gas Industry Survey for 2007 shows that both of these approaches are very widely used in California. 37 percent of controllers in the state were electric, while 47 percent were instrument air driven (and a full 87 percent of valve actuators in the state were air driven).⁸¹

OP-19-25

⁷⁶ Carbon Limits at 12.

⁷⁷ Carbon Limits at 15.

⁷⁸ Carbon Limits at 15.

⁷⁹ Carbon Limits at 15.

⁸⁰ Carbon Limits reports that instrument air is applicable at larger sites (roughly 20 or more controllers on site) when power is available from the grid or from an on-site generator (*See* Carbon Limits at 18) and that electric controllers are applicable at sites of all sizes if power is available, and, in combination with solar power, applicable at smaller sites (20 or fewer controllers) when power is not otherwise available. *See* Carbon Limits at 15. However, Carbon Limits reports that there is no technical barrier to the use of electric controllers with solar panels at larger sites; there is simply little known precedent of this type of installation. *See* Carbon Limits at 16.

⁸¹ ARB (2013), *2007 Oil and Gas Industry Survey Results - Final Report (Revised)*, at Table 9-2.

Carbon Limits also found that these technologies are cost effective as alternatives to traditional gas-driven pneumatic controllers at a wide variety of oil and gas facilities. Carbon Limits used the capital and operating costs of these systems and traditional pneumatic controllers,⁸² together with highly conservative estimates of emissions from gas-driven pneumatic controllers⁸³ and other parameters such as the value of conserved natural gas⁸⁴ to calculate the net cost of these systems per metric ton of avoided methane pollution, using a net present value formulation. Because there are a wide variety of site configurations for oil and gas sites, and because costs for these systems do not vary in a simple linear fashion with the number of controllers at the site and other parameters, Carbon Limits calculated the costs of both instrument air systems and electric systems for many permutations of a large number of site parameters, including:

- The number of pneumatic controllers at the site (1 – 40 controllers for electric systems, 21-40 controllers for instrument air systems).
- The number of pneumatic pumps at the site (0 – 1 pump).
- The type of pneumatic controllers at the site (from all continuous-bleed to all intermittent-bleed).
- The type of gas at the site (wet gas or dry gas).
- New site or retrofit site.
- Whether electricity is available at the site (for electric controllers at sites with 20 or fewer controllers).

Carbon Limits used US EPA's latest calculation of the social cost of methane (SC-CH₄) as the threshold for cost effectiveness. Specifically, they used the mean value of the SC-CH₄ calculated for a 3 percent discount rate for emissions in 2020, in 2016 dollars, or \$1,354 per metric ton of methane, as the threshold.⁸⁵ Using the global warming potential for methane of 72, which ARB uses in this rulemaking, the abatement costs ARB calculates for the proposed standards translate to abatement costs within the range of the social cost of methane.⁸⁶ In fact, the total abatement costs for the rule are lower than the 2016-adjusted SC-CH₄ calculated by ARB.

OP-19-25
cont.

⁸² Costs were derived from interviews with oil and gas producers, system and component suppliers, and online quotes from component suppliers.

⁸³ Carbon Limits at 21-22.

⁸⁴ The report uses a very low price of natural gas, \$2 per thousand cubic feet (mcf). See Carbon Limits at 21.

⁸⁵ EPA reports that the mean SC-CH₄ emitted in 2020, calculated with a 3% discount rate, will be \$1,300 per metric ton CH₄ in 2012 dollars. See US EPA, "Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources" (May 2016) at 4-16. Available at: <https://www3.epa.gov/airquality/oilandgas/may2016/nsps-ria.pdf>. This is converted to \$1,354 per metric ton in 2016 dollars using a cumulative rate of inflation of 4.2 percent.

⁸⁶ ARB Economic Analysis at Table B-2.

TABLE 1

ARB Rule Provision Methane Reduction Costs per Ton	VRU For Tanks	Reciprocating Compressors	LDAR	Pneumatic Devices	Well Simulations	Centrifugal Compressors	Total
Cost Per Ton (\$/MTCH ₄ reduced)	\$648	\$288	\$1,224	\$288	\$6,552	\$144	\$1,224
Cost Per Ton with savings (\$/MTCH ₄ reduced)	\$576	\$72	\$1,008	\$72	\$6,552	(\$72)	\$1,080

Source: Table adapted from Table B-6 of Appendix B: Economic Analysis for the proposed rule. Costs in Table B-6 were converted to \$/metric ton of methane using the IPCC AR4 20-year GWP of 72, per the ARB rulemaking analyses.

It should be noted that the SC-CH₄ costs are likely conservative. Experts widely acknowledge that social cost estimates are almost certainly underestimates of true global damages—perhaps severe underestimates. Using different discount rates; selecting different models; applying different treatments to uncertainty, climate sensitivity, and the potential for catastrophic damages; and making other reasonable assumptions could yield very different, and much larger, social cost estimates for carbon and methane.⁸⁷

In general, replacing gas-driven pneumatic controllers with either instrument air or electric controllers (or both) is cost effective at the vast majority of site configuration, even with highly conservative assumptions about emissions factors for pneumatic controllers. This finding holds for both new installations and retrofit of existing sites with pneumatic controllers. In fact, Carbon Limits found that these technologies would *not* be cost effective for just a handful of site configurations. For example, at least one of the technologies is cost effective at:

- All sites with one (or more) pneumatic pumps.
- Any new wet gas site with more than two pneumatic controllers.

For large sites with electricity, instrument air is cost effective for:

- All retrofit sites.
- All wet gas sites.

As mentioned above, these results were calculated with very conservative (low) emissions factors for gas-powered pneumatic controllers. For example, at new sites, Carbon Limits assumes that each continuous-bleed pneumatic controller will have an emissions factor of 1.39 scfh.⁸⁸ This is EPA's emissions factor for low-bleed pneumatic controllers,⁸⁹ which operators are required to use for new continuous-bleed pneumatic controllers under NSPS Subpart

⁸⁷ Richard L. Revesz, Peter H. Howard, Kenneth Arrow, Lawrence H. Goulder, Robert E. Kopp, Michael A. Livermore, Michael Oppenheimer & Thomas Sterner, *Global Warming: Improve Economic Models for Climate Change*, 508 NATURE 173 (2014). Available at:

http://www.nature.com/polopoly_fs/1.14991!/menu/main/topColumns/topLeftColumn/pdf/508173a.pdf

This study focuses on social cost of carbon, but the EPA NSPS RIA notes that “because the SC-CO₂ and SC-CH₄ methodologies are similar, the limitations also apply to the resulting SC-CH₄ estimates.” (RIA Section 4.3).

⁸⁸ Carbon Limits at 22.

⁸⁹ See for example, 40 CFR Part 98, Subpart W, Table W-1A.

OOOO.⁹⁰ However, both NSPS Subpart OOOO⁹¹ and ARB's proposed standards for continuous-bleed pneumatic controllers (proposed § 95668(f)(2)(A)(1)) allow the use of devices that emit up to 6 scfh. Further, several recent studies based on measured emissions from pneumatic controllers have found higher average emissions from continuous-bleed pneumatic controllers classified as "low-bleed controllers."⁹² If emissions factors consistent with these studies are used instead of the very conservative emissions factors used in the calculations described above, even more sites would have abatement costs below the SC-CH₄.⁹³

OP-19-26
cont.

In summary, Carbon Limits found that, even with very conservative assumptions, electric systems and instrument air systems are cost effective at a broad range of oil and gas facility site configurations.

Other Approaches to Eliminate Pneumatic Controller Emissions. It is important to note that other approaches can be used to eliminate emissions from pneumatic controllers, beyond instrument air and electric controllers. As listed above, two important approaches are use of "self-contained" or "integral" controllers which are designed to release the gas used in the controller into a gas pipeline, typically downstream of the controller and the valve it actuates, and routing emissions from pneumatic controllers to vapor collection systems. Data from the ARB Oil and Gas Industry Survey for 2007 shows that both of these approaches are in use in California. California operators captured gas from 6 percent of intermittent-bleed pneumatic controllers and 11 percent of piston valve actuators driven by natural gas, statewide; operators also reported 1,054 "no-bleed" controllers, which appear to self-contained/integral controllers (note that air-driven and electric controllers are separate categories in the survey).⁹⁴

OP-19-27

Carbon Limits notes that these technologies may be applicable and cost effective for oil and gas installations, and that they represent useful alternatives to instrument air and electric controllers.⁹⁵

Summary. There are a number of non-emitting technologies and approaches that can be used in lieu of traditional gas-driven pneumatic controllers. All are in use in California. The most significant of these from both effectiveness and cost perspectives are instrument air and electric systems. Recent analysis by Carbon Limits shows that, even with very conservative assumptions, electric systems and instrument air systems are cost effective technologies to reduce methane emissions at a broad range of oil and gas facility site configurations.

OP-19-28

⁹⁰ 40 C.F.R. § 60.5390.

⁹¹ 40 C.F.R. § 60.5390(c)(1).

⁹² Allen, D.T., et al, "Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers," (2015) Environ. Sci. Technol., 49, at 633–640 ("Allen (2015)"), available at <http://pubs.acs.org/doi/abs/10.1021/es5040156>.

The Prasino Group, Determining bleed rates for pneumatic devices in British Columbia; Final Report, (Dec. 18, 2013), at 19, ("Prasino Study"), available at http://www2.gov.bc.ca/assets/gov/environment/climate-change/stakeholdersupport/reporting-regulation/pneumatic-devices/prasino_pneumatic_ghg_ef_final_report.pdf.

⁹³ Carbon Limits at 27 – 28, 33.

⁹⁴ ARB, *2007 Oil and Gas Industry Survey Results - Final Report (Revised)*, (2013) at Table 9-2.

⁹⁵ Carbon Limits at 19-20.

2. *ARB Should Phase Out Existing Low-Bleed Continuous Devices and Require Quarterly Testing of Bleed Rate*

The proposed regulation is significantly weaker than the draft regulation that CARB posted on April 22, 2015. The proposal allows the use of continuous-bleed pneumatic devices installed before January 1, 2016, provided operators adhere to the provisions in proposed § 95668(f)(2)(A), which requires that these devices emit less than 6 scfh and that operators annually check that these devices are not emitting more than that amount and fix or replace them if they do emit over this threshold. This “grandfather” clause that allows for the *indefinite* use of continuous bleed devices is not warranted, in light of the fact that operators have a number of alternatives to continuous-bleed pneumatic controllers, and the finding that electric controllers and instrument air are proven, mature, widely applicable and cost effective technologies.

We thus recommend that ARB remove the provision allowing “low-bleed” continuous-bleed pneumatic devices that were in operation on January 1, 2016 to continue operating. If ARB concludes that such devices must be allowed to continue venting gas into the atmosphere, despite the numerous options operators have to eliminate these emissions, ARB must limit the period over which operators are allowed to continue these harmful emissions to at most a few years. Indefinite grandfathering is not warranted.

Further, the February 1, 2016 draft rule required operators to test existing devices “during each inspection period as specified in section 95669 by using a direct measurement method (high volume sampling, bagging, calibrated flow measuring instrument)”.⁹⁶ However, the current draft only requires annual testing.⁹⁷ As ARB provided no explanation for the change in testing requirements and testing devices during inspections is feasible and necessary to ensure bleed rate information is up to date, we recommend that ARB amend the current proposal to require testing during each quarterly LDAR inspection, as previously proposed.

3. *Control Emissions from Intermittent-bleed Pneumatic Devices*

ARB’s proposal for intermittent-bleed pneumatic controllers will reduce emissions from these ubiquitous devices, due to the specific annual testing requirements to ensure that these devices do not leak gas into the air when not actuating.⁹⁸ However, we reiterate our concern that, beyond this provision, the proposed regulation, like previous drafts, does not limit emissions from these devices.

These devices are a very significant source of emissions. Oil and gas producers reported over 850,000 metric tons of methane emissions nationwide in 2014 from intermittent-bleed

OP-19-29

OP-19-30

⁹⁶ CARB Proposed Regulation Order, February 1, 2016 Draft, § 95668(f)(2)(C). Available at http://www.arb.ca.gov/cc/oil-gas/meetings/Draft%20ARB%20OG%20Regulation_Feb%201%202016%20Clean.pdf

⁹⁷ Appendix A: Proposed Regulation order § 95668(f)(2)(A)(3).

⁹⁸ Proposed § 95668(f)(3).

devices to US EPA's GHGRP, far higher than the 161,000 metric tons of methane they reported from continuous-bleed devices (both high-bleed and low-bleed).⁹⁹

OP-19-30
cont.

Intermittent-Bleed Controller Counts for California. There is very strong evidence that there are a significant number of intermittent-bleed pneumatic controllers in California. Operators in California oil and gas production basins reported over 4,100 tons of methane in 2014 from over 2,000 intermittent-bleed devices, while reporting no emissions at all from continuous-bleed devices (see Table 2).¹⁰⁰ Alarming, reported emissions from intermittent-bleed devices are increasing, both nationwide and in California (California counts leveled off between 2013 and 2014, see Table 3).¹⁰¹

OP-19-31

Table 2. Device counts and methane emissions (in metric tons of methane) for high-bleed, intermittent-bleed, and low-bleed pneumatic controllers from oil and natural gas production basins in California as reported to US EPA's GHGRP for 2014. All listed AAPG oil and gas production basins are entirely within California. 730: Sacramento Basin; 745: San Joaquin Basin; 750: Santa Maria Basin; 760: Los Angeles Basin.

<i>Pneumatic Device Counts, 2014</i>					
Device Type	CA Basins				Total (count)
	730	745	750	760	
High	0	0	0	0	0
Int	1,531	466	11	0	2,008
Low	0	0	0	0	0
				Total	2,008
<i>Pneumatic Device Methane Emissions, 2014</i>					
Device Type	CA Basins				Total (MT CH ₄)
	730	745	750	760	
High	0	0	0	0	0
Int	3,289	817	21	0	4,127
Low	0	0	0	0	0
				Total	4,127

⁹⁹ US Environmental Protection Agency. Greenhouse Gas Reporting Program (GHGRP). Petroleum and Natural Gas Systems. W_PNEUMATIC_DEVICE_TYPE. Converted from metric tons carbon dioxide equivalent to metric tons of methane using a GWP of 25.

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

Table 3. EPA GHGRP Reported Onshore Production Pneumatic Device Counts by Type in California for 2011-2014. Counts are the sum of counts from the four basins shown in Table 2 above.

Pneumatic Device Type	201 1	201 2	201 3	201 4
High-Bleed Pneumatic Devices	23	-	-	-
Intermittent Bleed Pneumatic Devices	1,9 54	3,2 83	4,1 43	4,1 27
Low-Bleed Pneumatic Devices	16	-	-	-
Grand Total	1,9 92	3,2 83	4,1 43	4,1 27

Reporters to the GHGRP determine pneumatic device type “using engineering estimates based on best available information.”¹⁰² That is, operators make the determination as to pneumatic device type according to engineering assessments and available information regarding the device. Determining whether a pneumatic controller is designed to release gas intermittently or continuously is fairly straightforward. While emissions from these devices and the industry as a whole have received significant attention in recent years,¹⁰³ we are aware of no evidence or arguments that operators are over-reporting the number of intermittent-bleed controllers.

OP-19-31
cont.

Further, according to the ARB Oil and Gas Industry Survey for 2007, there were at least 405 intermittent bleed pneumatic devices in California (accounting for about 25 percent of the total natural gas driven pneumatic controllers in the survey inventory). This information was reported a number of years ago, whereas the most recent GHGRP data is for 2014 and was reported in 2015. With the increased attention on emissions in recent years and the requirements of the GHGRP in place for several years, operators may now be more aware of the population of specific types of pneumatic controllers at their facilities than they were in 2007. In addition, operators may have installed more new intermittent-bleed controllers and/or replaced some of their continuous-bleed controllers with intermittent-bleed controllers in response to federal regulations that prohibit the installation of new high-bleed continuous controllers.¹⁰⁴

OP-19-32

Finally, we note that the ARB MRR data for various types of pneumatic controllers may be flawed. Unfortunately we have not been able to extract data for emissions specifically from intermittent-bleed controllers, or counts of intermittent-bleed controllers, from the publically available data from this program. However, the ARB MRR apparently requires operators to sort intermittent-bleed controllers into low-bleed and high-bleed categories (based on the 6 scfh threshold) for reporting controller *counts* in Cal e-GGRT, while *emissions* from all intermittent-bleed controllers are calculated using a single emissions factor (13.5 scfh), regardless of the bleed rate:

OP-19-33

¹⁰² 40 CFR § 98.233(a)(3).

¹⁰³ For example, see Allen, D.T., et al. (2015); also US EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2014: Revisions to Natural Gas and Petroleum Production Emissions*, (2016). Available at: <https://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2016-Main-Text.pdf>

¹⁰⁴ 40 C.F.R. 0000 (2012).

3.14 How should emissions from unmetered, natural gas-powered intermittent-bleed pneumatic devices be quantified and reported, if the operator has documentation demonstrating that the actual bleed rate for the devices is less than six scf per hour?

Pursuant to MRR, “intermittent bleed devices which bleed at a cumulative rate of six standard cubic feet per hour or greater are considered high bleed devices” (section 95102(a)(252)), therefore, *emissions from devices that exceed this limit must be reported as high-bleed* in Cal e-GGRT and are subject to a compliance obligation under the Cap-and-Trade Program. A low-bleed pneumatic device is defined in MRR as a device that “vents continuously or intermittently bleeds to the atmosphere at a rate equal to or less than six standard cubic feet per hour” (section 95102(a)). *Low-bleed pneumatic devices must be reported as low-bleed* in Cal e-GGRT and emissions from such devices are not subject to a compliance obligation under the Cap-and-Trade Program.

Emissions from all unmetered, natural gas-powered intermittent-bleed pneumatic devices must be quantified using the “intermittent bleed” emission factor of 13.5 scf/hour/component listed in Table 1A of Appendix A of MRR, using Equation 2 (section 95153(b)), *regardless of bleed rate*. If the operator has documentation that demonstrates that the devices bleed at an actual rate of less than six scf/hour/component, such as original equipment manufacturer’s specifications, or measurement data, the operator must still quantify the emissions using the 13.5 scf/hour/component emission factor; however, the emissions may be reported as “low bleed” pneumatic emissions in Cal e-GGRT. If the device bleeds at a rate of six scf/hour/component or greater, or there is no documentation available that demonstrates that the actual bleed rate of a device is less than or equal to six scf/hour/component, the emissions for such devices must be reported as “high bleed” pneumatic device emissions in Cal e-GGRT.¹⁰⁵

This treatment of intermittent-bleed pneumatic controllers is confusing at best and suggests that ARB MRR data may not be usable to differentiate intermittent-bleed and continuous-bleed controller counts and emissions.

In summary, the available evidence shows that there are thousands of intermittent-bleed pneumatic controllers in California, with thousands of metrics tons of methane emissions. Since the proposed regulation does not allow new installation of continuous-bleed pneumatic controllers that vent to the atmosphere, but allows continued installation of intermittent-bleed pneumatic controllers, we can expect more intermittent controllers to be installed in the future, making this source of methane pollution grow.

Emissions from Properly-Operating Intermittent-Bleed Pneumatic Controllers can be Substantial. While ARB’s proposal addresses one important source of emissions from intermittent-bleed pneumatic controllers – the fact that they frequently operator improperly and emit continuously – the emissions from properly operating devices will remain high without additional standards.

¹⁰⁵ ARB (2016), *Petroleum and Natural Gas Systems Emissions Reporting Guidance for California’s Mandatory Greenhouse Gas Reporting Regulation*, at Section 3.14 (emphasis added). Available at: <http://www.arb.ca.gov/cc/reporting/ghg-rep/guidance/oil-gas.pdf>

OP-19-33
cont.

OP-19-34

OP-19-35

Not all intermittent-bleed devices actuate frequently under normal and expected operating conditions – but some actuate very frequently, and therefore emit large amounts of natural gas. For example, Allen *et al.* (2015) observed that controllers for emergency shut-off devices (ESDs) made up 12 percent of the population of controllers that they studied.¹⁰⁶ These devices will actuate very rarely, if at all. In contrast, some intermittent-bleed devices actuate very frequently. Of the 377 devices studied by Allen *et al.* (2015), 24 were intermittent-bleed devices that actuated at least 10 times during the sampling period, which was typically 15 minutes. Four actuated over 50 times while sampled.¹⁰⁷ These devices can emit at high levels – five of the 40 highest emitting devices studied by Allen *et al.* (2015) are intermittent-bleed devices that the researchers assessed to be operating properly.¹⁰⁸ These controllers emitted up to 40 scfh of whole gas.¹⁰⁹ Devices with certain specific functions, such as level controllers on separators, are likely to actuate frequently.

OP-19-35
cont.

Since the proposed standard for intermittent-bleed pneumatic controllers does not limit emissions during actuation in any way, operators would not be required to reduce these high emissions in any way.

Suggested Approach. As noted above in Section X.1, reliable non-emitting alternatives to intermittent-bleed pneumatic controllers are available today. These technologies are mature and generally applicable and have been deployed at hundreds of sites, including in California. Critically, using these technologies as alternatives to intermittent-bleed pneumatic controllers is cost effective as a means of reducing methane emissions.

As such, ARB’s standards should prohibit or phase out venting emissions from intermittent-bleed pneumatic controllers to the atmosphere. If ARB concludes that it is warranted, specific treatment of certain intermittent-bleed devices that very rarely actuate, such as ESDs could be appropriate. However, the fact that some controllers very rarely actuate cannot be used to justify inaction for the entire class of intermittent-bleed controllers.¹¹⁰

OP-19-36

If ARB concludes that a simple standard prohibiting venting from intermittent-bleed pneumatic controllers is not warranted, despite the numerous alternative approaches and technologies that can be used to entirely avoid these emissions, then a standard that limits emissions from these devices is needed. Even where venting natural gas-driven pneumatic devices are used, lower-bleed intermittent pneumatic devices are available. Properly designed intermittent bleed devices can emit below 6 scfh in many applications.¹¹¹ The US EPA

¹⁰⁶ Allen D.T. *et al.*, (2015)

¹⁰⁷ Derived from analysis of table S4-1 in Allen *et al.* (2015) supplemental information.

¹⁰⁸ See Allen *et al.*, Supporting Information, section S-8 (2015). Temporal profiles of emissions from the 40 highest-emitting controllers sampled in the study are shown. Controllers LB01-PC01, LB07-PC01, LB04-PC01, LB06-PC05, and LB04-PC03 – five of the 40 highest emitting controllers – are clearly intermittent devices which were assessed to be “operating as expected.”

¹⁰⁹ *Id.* Controller LB01-PC01 emitted 40.2 scfh whole gas; the range for the controllers listed in the previous footnote was 19.1 – 40.2 scfh.

¹¹⁰ Since some intermittent-bleed devices actuate very rarely, their emissions are low. These devices bring the average emissions factor for intermittent-bleed devices down.

¹¹¹ In their comments on EPA’s 2012 oil and gas rules, the American Petroleum Institute stated, “Achieving a bleed rate of < 6 SCF/hr with an intermittent vent pneumatic controller is quite reasonable since you eliminate the

emissions factor for intermittent bleed pneumatics in natural gas transmission is 2.35 scfh,¹¹² well below 6 scfh. Wyoming requires *all* pneumatic controllers to be low emitting, regardless of whether they are continuous-bleed or intermittent-bleed, at new and modified facilities.¹¹³ ARB could require operators to measure emissions from intermittent-bleed devices just as operators of continuous-bleed devices would be required to measure emissions. To verify that emissions were not above the threshold in the standard, a simple sampling protocol could be written, requiring measurement over a certain period of time, capturing emissions from any actuations that occurred during that time. Straightforward specifications for the time response and dynamic range of instrumentation could ensure that the devices used for these measurements accurately quantify the high flow rate from the controller occurring during actuation. This measurement approach would be similar to that used during a number of recent measurement studies of pneumatic controllers and other equipment, which included measurements from pneumatic controllers.¹¹⁴

OP-19-36
cont.

Standards as described above would substantially reduce methane emissions at a reasonable cost, and serve as an important model for reducing emissions from pneumatic controllers in other jurisdictions.

4. *Pneumatic Pumps*

We commend ARB's proposal to require capture of all emissions from natural gas-driven pneumatic pumps. Pneumatic pump emissions can readily be routed to vapor collection systems; US EPA now requires emissions from new pneumatic pumps to be routed to a control device if such a device is on the site where the pneumatic pump is installed.¹¹⁵ Electric pumps are also available to perform the duties of pneumatic pumps. For example, solar-powered chemical injection pumps are quite common,¹¹⁶ and in general pumps can be electrified when electric controllers are adopted at a site, including when solar panels are used to power the systems. In fact, these systems become significantly more cost effective when they include electrification of a pneumatic pump.¹¹⁷

OP-19-37

We believe that ARB intends the standards to apply to glycol assist pneumatic pumps, referred to as "Kimray Pumps" in EPA's GHG Inventory. These pumps are estimated to emit 76,418 metric tons of natural gas per year (nationwide), while chemical injection pumps are

continuous bleeding of a controller." In fact, API advocated intermittent-bleed devices to achieve the 6 scfh bleed rate, rather than continuous low-bleed devices. American Petroleum Institute, "Technical Review of Pneumatic Controllers," at 7 (Oct. 14, 2011), available as Attachment K to American Petroleum Institute, Comment on OOOO New Source Performance Standards (Nov. 30, 2011), <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2010-0505-4266>

¹¹² 40 C.F.R. Pt. 98, subpart W, Table W-3.

¹¹³ This requirement is applied to intermittent-bleed controllers in addition to continuous-bleed controllers (email from Mark Smith, WDEQ, to David McCabe, September 22, 2014. Available at: http://www.arb.ca.gov/cc/oil-gas/meetings/CATF_et_al_attachment2_02192016.pdf)

¹¹⁴ Allen, D.T., et al., "Measurements of methane emissions at natural gas production sites in the United States," (2013), Proc. Natl. Acad., 110, ("Allen (2013)"), available at <http://www.pnas.org/content/110/44/17768.full> Allen *et al.* (2015), Prasino Study.

¹¹⁵ 40 C.F.R. § 60.5365a(h) and § 60.5393a.

¹¹⁶ Carbon Limits at 13.

¹¹⁷ Carbon Limits at 26.

estimated to emit 321,777 tons.¹¹⁸ Control of emissions from glycol assist pumps is somewhat less straightforward than control of emissions from chemical injection pumps, because the natural gas used to drive the pump is typically emitted via the dehydrator vent stack. However, there are a number of options to eliminate emissions from these pumps. Electrification is an option for these pumps, just as it is for chemical injection pumps.¹¹⁹ A secondary option is the use of a low-pressure glycol separator, which can separate methane-rich gas from the glycol before it enters the regenerator.¹²⁰ If this is done, the gas can be used to fuel the boiler on the regenerator or otherwise consumed for fuel on-site.¹²¹ Finally, controls are often used to reduce emissions from dehydrator vent stacks. However, some of these controls, which are typically designed to reduce emissions of volatile organic compounds and hazardous air pollutants, will not reduce methane emissions from the dehydrator vent stack even when operating correctly.¹²² Methane from a glycol assist pump will not be abated by these types of dehydrator controls.

OP-19-37
cont.

ARB must ensure that all methane emissions from glycol assist pumps are properly controlled and that operators are not relying on dehydrator vent stack controls that will not properly control methane, such as condensers or carbon absorption systems, to control methane emissions from these pumps. As described above, there are a number of means to eliminate methane emissions from these pumps. Of course, in the case of dehydrators with controls that do not reduce methane emissions, the most appropriate approach would be to improve the emissions control on the dehydrator to reduce methane emissions from the glycol assist pump and from the dehydrator itself.

OP-19-38

V. Reciprocating Compressors

We support ARB's approach to control emissions from all compressors, both in the production and non-production segments, through either vapor collection systems or through requirements to measure emissions at the vent point and to repair when those emissions exceed thresholds. The scope of ARB's proposed requirements on compressors is commendable as it addresses the emissions of compressors on well pads – something that EPA's recently finalized subpart OOOOa regulations fail to do. Moreover, measurement from compressors located in the midstream segments – those at natural gas gathering and boosting stations, processing plants, transmission compressor stations and underground storage facilities – will provide more useful data on the emissions of those compressors.

OP-19-39

Furthermore, it is encouraging that pursuant to section 95668(d)(3)(A) and 95668(d)(3)(B), CARB's proposal would require inspections for leaks originating from compressor components and rod packing seals from production compressors at the same

¹¹⁸ GHG Inventory, 2016. Annex 3. Tables A-127, A-134, A-136.

¹¹⁹ 80 Fed. Reg. at 56,627.

¹²⁰ Kimray, Inc., "Glycol Pumps Product Bulletin," (July 2011), at 3.

¹²¹ *Id.*

¹²² For example, the National Emissions Standards for Hazardous Air Pollutants applicable to glycol dehydrators at certain facilities (NESHAP Subpart HH) allows the use of condensers or carbon absorption systems to control emissions. See 40 C.F.R. § 63.771(d)(1)(ii) and § 63.771(f)(1)(ii). These systems will not control methane emissions (the boiling point of methane is far too low for it to be captured by a condenser, and methane is not absorbed by activated charcoal to any significant degree).

frequency as that required by the LDAR provisions in section 96669(g).¹²³ Likewise, ARB's proposal requires frequent inspection of non-production compressor *components*.¹²⁴ However, CARB should extend that same requirement for frequent checks to emissions from rod packing seals to non-production compressors.

OP-19-39
cont.

While ARB's proposed rule has many helpful and protective requirements, it should be strengthened. Since even the best new, properly installed rod packing seals allow some escape of natural gas,¹²⁵ vapor collection systems should be required whenever possible. We agree that there should be an alternative option to monitor emissions by measuring and repairing rod packing when the measured flow rate exceeds an established threshold, but that alternative should be applicable only when utilization of vapor collection system is not feasible. We note that the Ohio EPA has released a draft general permit that requires operators to capture all emissions from reciprocating compressor rod packing and direct those emissions to sales, fuel lines, or 98 percent control.¹²⁶ Even if directing collected vapors to one of the uses described under proposed section 95668(c)(2) is not possible, ARB should require operators to capture and control emissions with a vapor control device as described in proposed section 95668(c)(3)-(4).

OP-19-40

We commend ARB for requiring flow rate measurements at the rod packing or seal vent stack, as opposed to measuring hydrocarbon concentration, for compressors at gathering and boosting stations, processing plants, transmission compressor stations and underground natural gas storage facilities. This method of direct flow rate measurement (*i.e.*, high volume sampling, bagging or calibrated flow measuring instrument) provides a much more accurate representation of the actual emissions, whereas hydrocarbon concentration is more weakly correlated with emissions.¹²⁷ Routing emissions through a vent stack makes measurements more accurate and more feasible for operators. However, as was the case with the draft standards, ARB's proposed regulations still only require annual measurements for non-production compressors when a vapor collection system is not installed. ARB should finalize a quarterly measurement frequency under proposed section 95668(d)(4)(B). Infrequent annual measurements can lead to two problems. First, annual measurements would allow potentially elevated emissions to continue over a longer period than quarterly measurements would allow. Second, the lax annual frequency could encourage operators of non-production compressors without vapor collection systems to continue operating without such systems. Therefore, ARB should require quarterly measurements for non-production compressors. As we have argued previously, direct measurement of emissions rates with instruments such as flow meters and high-flow samplers is inexpensive and some vendors providing LDAR service routinely measure emissions rates in this manner; requiring measurement of the emission rate at every regular LDAR inspection would only entail very minimal additional cost.

OP-19-41

¹²³ As discussed in more detail above, improvements to the section 95669 are needed.

¹²⁴ Proposed section 95668(d)(4)(A).

¹²⁵ See CARB Staff Report at 97, Table 9 (citation omitted).

¹²⁶ Ohio EPA, General Permit 17.1 Template, C(1)(b)(1)(d), available at <http://epa.ohio.gov/dapc/genpermit/permitsec.aspx>.

¹²⁷ Clearstone Engineering et al. (2006), *Cost-Effective Directed Inspection and Maintenance Control Opportunities at Five Gas Processing Plants and Upstream Gathering Compressor Stations and Well Sites*, 3 (available at http://www.epa.gov/gasstar/documents/clearstone_II_03_2006.pdf).

Additionally, the flow rate threshold at which ARB would require repair or replacement of rod packing or seals is far too high. As proposed, section 95668(d)(4)(D) requires repair of rod packing or seals when the measured flow rate is greater than 2 scfm per cylinder. ARB's analysis shows that using this threshold will result in costs of \$1.17/MT CO₂e, or \$84/MT methane.¹²⁸ Based on the Oil and Gas Industry Survey, ARB's analysis assumes that a compressor over 250 HP has on average 3.45 cylinders, and that the average leak rate for a cylinder during pressurized operation is 0.9 scfm.¹²⁹ Data from the survey shows that the average compressor cylinder that is emitting over the threshold of 2 scfm is emitting 3 scfm.¹³⁰ In calculating the reductions, ARB simply estimated a reduction of 1 scfm per cylinder in order to comply with the proposed standard.¹³¹ This vastly underestimates the emissions reductions that would be achieved under the proposed requirement to repair rod packing or seals if the flow rate exceeds 2 scfm.

OP-19-42

As shown in ARB's Staff Analysis, a rod packing flow rate of 2 scfm is labeled as "poor" condition.¹³² Presumably, ARB's proposed regulation would require an operator to repair the rod packing to better than poor condition. Indeed, EPA estimates that new rod packing should emit 11-12 scfh, or roughly equivalent to 0.19 scfm. We recalculated abatement costs using the same methodology and cost inputs as ARB used in the Economic Analysis. However, for the emissions reduction achieved by the rule, we used 2.81 scfm (3 scfm to 0.19 scfm) instead of 1 scfm (3 scfm to 2 scfm) as ARB used. The resulting costs were -\$1.27 per ton CO₂e, *i.e.* the policy has net savings for operators.

OP-19-43

Using a slightly different approach to calculating abatement cost from EPA's Natural Gas Star, but with ARB's cost assumptions¹³³ we calculated a number of different net abatement costs using the reductions that would be achieved using EPA's 0.19 scfm emission rate for a new rod packing.¹³⁴ The abatement costs calculated this way are somewhat different, but they appear to be more conservative than ARB's calculations and they show net savings at ARB's current repair threshold of 2 scfm, consistent with the calculation shown above. As Table 4 shows, ARB's cost analysis substantially overestimates the actual cost to operators and the costs of significantly tighter standards than ARB's proposed standard would be reasonable. At a flow rate threshold of 2 scfm the net cost per ton of methane removed is actually negative, meaning operators would make more money from the sale of the conserved gas than they incurred in costs. The total cost would be zero if ARB lowered the flow rate threshold to 1.82 scfm, and the net abatement cost approaches ARB's estimated average cost for the entire regulation at 0.48 scfm.

OP-19-44

¹²⁸ ARB, *Appendix B: Economic Analysis*, at B-34.

¹²⁹ Appendix B at B-29.

¹³⁰ Appendix B at B-29.

¹³¹ Appendix B at B-29.

¹³² ARB, *Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, Staff Report: Initial Statement of Reasons*, at 97, table 9.

¹³³ A cost of \$6,000 per rod packing, a 5 percent interest rate, an average of 6,546 pressurized operating hours and a price of \$3.44/mcf for gas.

¹³⁴ US EPA "Reducing Methane Emissions from Compressor Rod Packing Systems" (2006), available at: https://www3.epa.gov/gasstar/documents/ll_rodpack.pdf

Table 4

Replacement Threshold		Net Abatement Cost		
scfm	scfh	\$/metric ton methane	\$/metric ton CO ₂ e (72)	\$/mcf
2	120	-\$22	-\$0.31	-\$0.3
1.82	109	\$0	\$0.00	\$0
0.86	51	\$331	\$4.59	\$5
0.61	37	\$662	\$9.19	\$10
0.50	30	\$992	\$13.78	\$15
0.48	29	\$1,059	\$14.70	\$16
0.47	28	\$1,125	\$15.62	\$17
0.43	26	\$1,323	\$18.38	\$20
0.42	25	\$1,389	\$19.30	\$21

Accordingly, CARB must reduce the threshold at which replacement or repair of rod packing is required. A standard set in the 0.4 – 0.5 scfm range would be cost-effective and more appropriately balance the need to reduce methane emissions, and the social costs of those emissions, while keeping costs for industry reasonable.

OP-19-45

Finally, ARB should consider finalizing a requirement for operators of production compressors to perform direct measurement of the flow rate in a manner consistent with non-production compressors, as opposed to requiring repair based on concentration thresholds. As described above, the additional cost of direct emissions measurement during regular LDAR inspections would be quite small.

OP-19-46

VI. Separator and Tank Systems

1. ARB Should Remove the “Low Production” Exemption

We urge ARB to remove the exemption for separator and tank systems that receive less than 50 barrels of crude oil per day and that receive less than 200 barrels of produced water per day. ARB added this exemption based on its own analysis of flash test data that indicated that emissions from such separation and tank systems will not reach the control threshold of 10 metric tons of methane per year.¹³⁵ This exemption is overly broad and may result in tanks that in fact exceed the control threshold going uncontrolled. ARB already proposes to require owners and operators of separator and tank systems covered by Section 95668(a) to either control emissions or conduct periodic flash analysis testing to determine whether or not controls are warranted. Owners and operators of separator and tank systems that receive less than 50 barrels of crude oil per day and that receive less than 200 barrels of produced water per day should still be required to conduct periodic flash analysis to ensure that any increase in production does not

OP-19-47

¹³⁵ Statement of Reasons, 90.

result in methane emissions that trigger the control requirements. If ARB's analysis is correct, and emissions from such systems remain under 10 metric tons of methane annually, owners and operators will only be subject to the periodic modest flash analysis testing requirements which should not impose a significant burden on operators. For these reasons, we urge ARB to remove this exemption.

OP-19-47
cont.

2. Testing Should Occur Earlier and Controls Should be Installed Sooner

ARB should tighten deadlines related to both commencement of annual flash analysis testing and installation of vapor collection systems. In previously submitted comments, we expressed concern that the prior version of the draft regulation allowed vessels to operate without any emission controls for an unjustifiably long period of time. Section 95668(a)(3) of the current draft provides that "[b]y January 1, 2018, owners or operators of existing separator and tank systems that are not controlled for emissions with the use of a vapor collection system shall conduct flash analysis testing of the crude oil, condensate, or produced water processed, stored, or held in the system" (with no requirement to actually control emissions unless this analysis demonstrates emissions in excess of ten metric tons of methane per year). While the prior draft of the rule required that annual flash analysis testing be conducted beginning January 1, 2017 and by no later than September 1, 2017, the latest draft clarifies the deadline for existing systems but unfortunately pushes it back to 2018. For existing systems, ARB should require that owners and operators conduct testing by a date certain that is earlier than September 1, 2017.

OP-19-48

Furthermore, for existing separator and tank systems, the draft rule requires that by January 1, 2019, owners or operators of a system "with an annual emission rate greater than 10 metric tons per years of methane shall control the emissions from the separator and tank system and uncontrolled gauge tanks located upstream" with the use of a vapor collection system. §95668(a)(6). As with the deadline for flash analysis testing, ARB should require that owners and operators control emissions at an earlier date. As drafted, the rule would allow existing separator and tank systems that are currently emitting methane at a rate greater than 10 metric tons per year to wait almost two and a half years from now before controlling those emissions. This delay is unwarranted and the timeline for flash analysis testing and installation of a vapor collection system should be accelerated.

OP-19-49

In previously submitted comments, we expressed concern that the prior version of the draft regulation may allow new vessels to operate without any emission controls for the first year of operation. The latest draft rule also clarifies the timing for new systems: "Beginning January 1, 2018, owners or operators of new separator and tank systems that are not controlled for emissions with the use of a vapor collection system shall conduct flash analysis testing of the crude oil, condensate, or produced water processed, stored, or held in the system *within 90 days* of initial system startup." § 95668(a)(4) (emphasis added). The rule also clarifies that beginning January 1, 2018, owners or operators of new systems with an annual emission rate greater than 10 metric tons per year of methane must control the emissions with the use of a vapor collection system *within 180 days* of conducting flash analysis testing. 95668(a)(7) (emphasis added). Thus, under the proposed rule, a new system that exceeds the 10 metric tons per year threshold may not have to control those emissions for 270 days (approximately 9 months) after initial system startup.

OP-19-50

Emissions are likely to be highest during the first year. Oil and gas well production generally declines during the first year of operation. Throughput of materials (oil, produced water, and other substances) in vessels tracks production, meaning that potential vessel emissions follow this curve as well. Thus, the draft regulation could allow emissions without control during a large portion of the time when those emissions will be highest.

OP-19-50
cont.

As noted in our prior comments, other jurisdictions have successfully implemented regulations that require control of tanks much sooner after production begins at a well. Colorado requires operators to assess whether emissions will be significant from tanks – and if so, to control vessels from the date of initial production at the well. As noted in our prior comments, in crafting emission control requirements for vessels, the Colorado Air Pollution Control Division expressed concern that even allowing operators to wait *ninety days* after commencement of production to install controls on vessels would allow significant and avoidable air pollution.¹³⁶ Colorado determined that it would be cost effective to require controls to be installed on all crude oil and produced water tanks immediately, allowing operators to remove controls from a tank once testing demonstrated that the tank’s uncontrolled emissions would fall below the applicable threshold. A presumption of control has the added benefit of providing operators with an incentive to test emissions promptly. ARB should follow Colorado’s lead and assume that vessels require emission controls unless and until operators demonstrate otherwise.¹³⁷

OP-19-51

Alternately, US EPA requires that emissions from new and modified storage vessels that have potential to emit six tons of VOC or more per year must control emissions from those vessels by 60 days after the vessel goes in service.¹³⁸ We suggest that testing should, at the very least, be carried out within 30 days of initial production, and that ARB require that controls be in place within 60 days after initial production for tanks that have potential emissions above the threshold, in line with the federal standards (note that the federal standards have a different, VOC-based threshold than the draft ARB standard). However, we reiterate that ARB should first consider requiring control from the day of initial production when emissions from the tank can be anticipated to exceed 10 metric tons per year, in accordance with the Colorado approach.

OP-19-52

ARB must also ensure that for new wells, the Test Procedure for Determining Annual Flash Emission Rate of Methane from Crude Oil, Condensate, and Produced Water properly assesses annual emissions. It is critical that operators assess potential emissions rapidly after operation of a tank begins, so that the tank can be controlled if needed. But ARB must also ensure that operators do not use a simple extrapolation of low production in the first days after production begins to conclude that potential emissions from the vessel will be less than the 10 metric tons per year threshold. Such extrapolation would be inappropriate because for new

OP-19-53

¹³⁶ Colorado Air Pollution Control Division, Final Economic Impact Analysis for Proposed Revisions to Colorado Air Quality Control Commission Regulation Number 5 (5 CCR 1001-9), pages 8-9 (Jan 30, 2014), available at [http://ft.dphe.state.co.us/apc/aqcc/Oil%20&%20Gas%20021914-022314/REBUTTAL%20STATEMENTS,%20EXHIBITS%20&%20ALT%20PROPOSAL%20REVISIONS/Air%20Pollution%20Control%20Division%20\(APCD\)/APCD%20REB%20R7.finalEIA.pdf](http://ft.dphe.state.co.us/apc/aqcc/Oil%20&%20Gas%20021914-022314/REBUTTAL%20STATEMENTS,%20EXHIBITS%20&%20ALT%20PROPOSAL%20REVISIONS/Air%20Pollution%20Control%20Division%20(APCD)/APCD%20REB%20R7.finalEIA.pdf)

¹³⁷ See February 2016 comments for a comparison of the requirements and timelines in the CARB draft rule to those in the Colorado methane rule.

¹³⁸ See 40 C.F.R. §60.5395(d)(1)(i). “For each Group 2 storage vessel affected facility [that is, vessels constructed after 12 April 2013], you must achieve the required emissions reductions by April 15, 2014, **or within 60 days after startup**, whichever is later” (emphasis added).

wells, particularly wells that were hydraulically fractured, production can rise dramatically over the initial weeks after production begins. ARB thus must ensure that operators use liquid throughput values in Equation 1 of Section 11 of the Test Procedure that are appropriate for yearly averages for new wells.

OP-19-53
cont.

3. Provisions Requiring Clarification or Strengthening

ARB should also clarify or strengthen the following provisions:

- 95668(a)(5)(F): “The ARB Executive Officer may request additional flash analysis testing or information in the event that the test results reported do not reflect representative results of similar systems.” Please clarify how the ARB Executive Officer would determine whether the test results “reflect representative results of similar systems.”
- 95668(a)(8): “If the results of three consecutive years of [flash analysis] test results show that the system has an annual emission rate of less than or equal to 10 metric tons per year of methane the owner or operator may reduce the frequency of testing and reporting to once every five years.” Testing once every five years is too infrequent to effectively determine if emissions have increased above 10 metric tons per year.
- 95668(a)(8)(A): “After the third consecutive year of testing, if the annual crude oil, condensate, or produced water throughput increases by more than 20 percent after one year from the date of previous flash analysis testing, then the annual methane emissions shall be recalculated using the laboratory reports from previous flash analysis testing.” The prior draft rule required recalculation of flash emissions with a *10 percent* increase in throughput, rather than 20 percent. The basis for this change is unclear since an increase in throughput of less than 20 percent could cause a meaningful increase in methane emissions. ARB should justify the 20 percent throughput threshold and if it cannot do so, require re-testing for any increase in throughput over that level tested in any of the prior testing years (or at the very least retain the 10 percent threshold). Furthermore, this provision should specify how soon after the increase of throughput must the flash emissions be recalculated. (The current draft appears to no longer include a provision specifically requiring flash analysis testing, record keeping and reporting to be conducted after adding a new well to the separator and tank system.)

OP-19-54

VII. Liquids Unloading

We support ARB’s approach with regards to Liquids Unloading emissions, either through capturing emissions using a vapor collection system, or measuring/calculating the volume of natural gas vented, and regularly reporting that volume. Joint commenters request the following in order to strengthen the liquids unloading proposal.

OP-19-55

First, we request that ARB revise its proposed definition of “Liquids Unloading” by striking the phrase “with the use of pressurized natural gas.”¹³⁹ Not all liquids unloading

¹³⁹ The current definition reads: “‘Liquids unloading’ means an activity conducted with the use of pressurized natural gas to remove liquids that accumulate at the bottom of a natural gas well and obstruct gas flow.” § 95667(a)(28).

technologies use pressurized natural gas to remove liquids, so the proposed definition potentially creates a loophole in the control and reporting requirements.

OP-19-55
cont.

We also urge ARB to make one improvement to the substantive control requirement and a few improvements to the reporting requirements in order to improve the protectiveness of the provision.

We urge ARB to follow the lead of Wyoming¹⁴⁰ and Colorado¹⁴¹ and to require operators to keep personnel on site when conducting manual liquids unloading activities. This ensures that any venting that occurs is kept to a minimum. We anticipate that a prudent operator would follow this practice as a matter of course, as having personnel onsite to supervise manual liquids unloading not only ensures that emissions are minimized but also results in a more effective and safe operation. ARB should include this requirement to ensure that such a prudent practice is followed across the board.

OP-19-56

In addition, we recommend several additions to the reporting requirements to allow ARB to closely monitor liquids unloading emissions and develop targeted standards in the future, should the need arise. Given the number of mitigation techniques available to operators, we expect that liquids can be unloaded without venting in the vast majority of cases. In this light, it is important that ARB use the reporting requirements to understand *why* operators vent wells during liquids unloading. ARB thus should require operators to report a number of well variables and conditions in the cases where venting does occur.

OP-19-57

The current standard requires operators to annually report the following information in the cases where liquids unloading emissions are not captured:

- Volume of natural gas vented to perform liquids unloading, and
- Equipment installed in the natural gas well(s) designed to automatically perform liquids unloading (*e.g.*, foaming agent, velocity tubing, plunger lift, etc.)¹⁴²

ARB should require operators to report a broader set of parameters and conditions while being more specific about the information required in the proposal. For each liquids unloading event at each well, ARB should require operators to report:

OP-19-58

- Volume of gas vented and duration of venting event.
- Volume of liquids removed from well during venting event.
- Well Characteristics:
 - API Number
 - Spud date and completion date

¹⁴⁰ Wyoming DEQ, Oil and Gas Production Facilities, Ch. 6, Sec. 2 Permitting Guidance, 13, 19, 24 (May 2016), available at <http://deq.wyoming.gov/media/attachments/Air%20Quality/New%20Source%20Review/Guidance%20Documents/5-12-2016%20Oil%20and%20Gas%20Guidance.pdf>

¹⁴¹ 5 C.C.R. 1001-9, § VII.H.1.b.

¹⁴² Proposed § 95668 (g)(2).

- A complete casing diagram, with all required depths reported as both measured depth and true vertical depth, including:
 - Ground elevation from sea level
 - Reference elevation (*i.e.* rig floor or Kelly bushing)
 - Well orientation: horizontal, vertical, or directional
 - Well depth
 - Sizes and weights of all casing, liners and tubing
 - Depths of shoes, stubs and liner tops
 - Depths of perforation intervals
 - Diameter and depth of hole
- Liquids accumulation rate (barrels of water accumulated per day)
- Gas production rate (before and after unloading event)
- Sales line pressure
- Shut-in pressure
- Gas temperature at wellhead
- If liquids removal technology used, details of method:
 - Plunger lift: with or without smart automation
 - Foaming agent: type
 - Velocity tubing: diameter
 - Pumps
 - Gas lift
- If no liquids removal technology used:
 - The normal operating practice for venting the well: automatic vent timer or manual vent with or without monitoring
 - Vent time

OP-19-58
cont.

We greatly appreciate the opportunity to comment on this important proposal and thank ARB for its leadership on this key climate and public health issue.

Respectfully submitted,

Darin Schroeder
David McCabe
Lesley Fleischman
Clean Air Task Force
18 Tremont St
Boston, MA 02108
dschroeder@catf.us

Tim O'Conner
Elizabeth Paranhos
Hillary Hull
Environmental Defense Fund
Offices in Los Angeles, San Francisco and Sacramento, California
Toconnor@edf.org

Briana Mordick
Meleah Geertsma
Natural Resources Defense Council
111 Sutter St., 21st Fl.
San Francisco, CA 94104
bmordick@nrdc.org

Elly Benson
85 Second Street, Second Floor
San Francisco, CA 94105
elly.benson@sierraclub.org



CALPINE CORPORATION

4160 Dublin Boulevard
Suite 100
Dublin CA 94568
925.557.2238

Electronically filed at: http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=oilandgas2016&comm_period=A

July 18, 2016

Clerk of the Board
California Air Resources Board
1001 I Street, Sacramento, California 95814

Subject: Comments on the proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities

Dear Chair Nichols and Members of the Board,

Calpine Corporation (“Calpine”) is writing in regard to the proposed Regulation for Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (the “Proposed Regulation”).

Calpine Corporation is America’s largest generator of electricity from natural gas and geothermal resources. Our fleet of 84 power plants in operation or under construction represents more than 27,000 megawatts of generation capacity. Through wholesale power operations and our retail business, Champion Energy, we serve customers in 21 states and Canada. We specialize in developing, constructing, owning and operating natural gas-fired and renewable geothermal power plants that use advanced technologies to generate power in a low-carbon and environmentally responsible manner. Of the ten largest electricity generators in the U.S., Calpine ranks as having the lowest overall emissions intensity for nitrogen oxides (“NO_x”) and sulfur dioxide (“SO₂”) and the lowest emissions intensity for carbon dioxide (“CO₂”) among those same ten generators’ fossil fuel fleets.¹

Calpine is also a long-time supporter of the California Global Warming Solutions Act of 2006, the Air Resources Board’s (“ARB”) Cap-and-Trade Program and California’s goals of reducing economy-wide greenhouse gas (“GHG”) emissions to 40% below 1990 levels by 2030 and 80% below 1990 levels by 2050. Calpine also actively supports regulation of GHG emissions at the federal level, including through its participation as *amicus curiae* in support of the U.S. Environmental Protection Agency’s (“EPA”) authority to require that permits for the largest

¹ See Natural Resources Defense Council et al., Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States, at 26 (2016), available at: <https://www.nrdc.org/sites/default/files/benchmarking-air-emissions-2016.pdf> (emissions and generation data from 2014).

sources include GHG emission controls.² In addition, as part of a broad coalition of power companies, Calpine is currently defending EPA's Clean Power Plan in litigation brought by 27 states and the coal industry in the U.S. Court of Appeals for the District of Columbia Circuit.³

While Calpine generally supports ARB's efforts to regulate GHG emissions from oil and natural gas production operations, Calpine is concerned that the Proposed Regulation sweeps too broadly and potentially includes very small operations within its scope.

OP-20-1

Calpine's affiliate, CPN Pipeline Company ("CPN Pipeline), operates six facilities in and around the Sacramento Valley that include some form of water/condensate separation and storage. None of these facilities includes natural gas production, compression or processing plants. However, section 95666 of the Proposed Regulation applies to, *inter alia*, "[c]rude oil, condensate, and produced water separation and storage." Proposed Regulation § 95666(a)(2). "Condensate" is defined as "hydrocarbon or other liquid, excluding steam, either produced or separated from crude oil or natural gas during production and which condenses due to changes in pressure or temperature." *Id.* § 95667(a)(9). "Crude oil and produced water separation and storage" is, in turn, defined as "all activities associated with separating, storing or holding of emulsion, crude oil, condensate, or produced water at facilities to which this subarticle applies." *Id.* § 95667(a)(14). These definitions appear to be intended to regulate condensate production and storage when such separation activities occur as part of the production of crude or natural gas or in association with crude or natural gas production, compression or processing activities. *See id.* § 95667(a)(9), (14) (defining covered water separation and storage as activities occurring "at facilities to which this subarticle [otherwise] applies").

OP-20-2

CPN Pipeline receives dry gas from producers of natural gas throughout the Sacramento Valley, which CPN Pipeline delivers through a network of pipelines to various electric generation facilities operated by Calpine and its affiliates. However, the gas received from such producers is not always dry and CPN Pipeline therefore conducts "polishing" dehydration and/or liquid separation at several facilities located along the transmission pipeline between the producers and the electric generating facilities. Because the Proposed Regulation would apply to "[c]rude oil, condensate, and produced water separation and storage", CPN Pipeline's facilities would appear to fall within the scope of section 95666(a)(2).

OP-20-3

Calpine does not believe that it was ARB's intention to include isolated condensate and water separation and storage facilities such as these (i.e., those which are not operated in association with any crude or natural gas production, compression or processing facilities) within the scope of the Proposed Regulation. The cost and regulatory burdens associated with developing and implementing a leak detection and repair ("LDAR") program for these remote facilities would outweigh any potential emission reduction benefit to be achieved through implementation of the Proposed Regulation at such facilities.

OP-20-4

² *See Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427, 2447 (2014) (citing brief for Calpine as *amicus curiae* in upholding EPA's authority to mandate that prevention of significant deterioration permits for so-called "anyway" sources require the best available control technology for GHGs).

³ *West Virginia v. EPA*, No. 15-1363 (D.C. Cir.).

July 18, 2016

Page 3

The Proposed Regulation provides an exemption from the separator and tank system standards for, *inter alia*, “[t]anks that recover less than 10 gallons per day of any petroleum product from equipment provided that the owner or operator maintains, and can make available at the request of the ARB Executive Officer, a record of the amount of liquid recovered.” *Id.* § 95668(a)(2)(F). CPN Pipeline’s facilities all produce less than 10 gallons per day of water and condensate. However, because of the facilities’ remote locations, tank volume is only recorded on a monthly basis. To clarify that these facilities should not be subject to the separator and tank system standards at section 95668(a), Calpine would recommend that ARB insert the words “or 300 gallons per month” immediately after the words “10 gallons per day” in section 95668(a)(2)(F).

OP-20-5

Even if CPN Pipeline’s separator and tank systems were to be excluded from the separator and tank system standards, they would nevertheless appear to be subject to the Proposed Regulation’s LDAR requirements. However, given the size and remote location of these facilities, the development and implementation of a LDAR program for each of them would involve significant time and effort, with very limited to no emissions benefit. Calpine would therefore urge ARB to exempt from the Proposed Regulation’s LDAR requirements any natural gas condensate and separator system/tank that has a throughput of less than 300 gallons per month and is not adjacent to or associated with any production facility, compressor station or processing plant.

OP-20-6

Thank you for the opportunity to submit this letter. Please contact us if you have any questions at barbara.mcbride@calpine.com or scott.vickers@calpine.com.

Sincerely,



Barbara McBride
Director—Environmental Services
Calpine Corporation



Scott Vickers
Compliance Manager
CPN Pipeline Company

Milan Steube, Independent Environmental Consultant
8 Rimani Drive, Mission Viejo, CA 92692

July 18, 2016

VIA Electronic Submittal at <http://www.arb.ca.gov/lispub/comm/bclist.php>

Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposed Regulation for "Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities"

Dear Sir or Madam:

Please refer to the attached compilation of comments regarding the May 31, 2016, version of the subject proposed regulation. These comments are offered from the perspective of regulated parties who will be required to understand and comply with the regulation. As such, the comments are intended to assist ARB staff in making revisions to the rule language to improve clarity and reasonableness of the requirements.

Thank you for the opportunity to comment. I can be reached via phone at 949-309-9310 or via e-mail at milans@cox.net.

Sincerely,

A handwritten signature in blue ink, appearing to read "Milan Steube", with a long horizontal flourish extending to the right.

Milan Steube

Attachment

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

General comments regarding throughput and flash emission calculations

Clarification is needed regarding the throughput value to be used for calculating annual separator / tank system emissions in 95668(a)(5)(C) and 95673(b)(2)(A)(3)(c), for determining eligibility for the exemption in 95668(a)(2)(A), and for calculating the percent increase in annual throughput in 95668(a)(8)(A). I suggest the value should represent average daily throughput for the previous full calendar year, i.e., total calendar year throughput in barrels divided by number of days in the year. This is consistent with an annual emissions threshold (10 MT CH₄ per year) and the manner in which emissions estimates and reductions are calculated in Appendix D of the Staff Report. Throughputs, lacking significant development activity, generally decrease with time for any given separator / tank system. So, use of the average daily throughput for the previous calendar year will generally yield a conservative (i.e., high) estimate of current annual throughput and emissions and will bring consistency to how various operators interpret the rule and quantify and report their flash emission calculations to ARB.

OP-21-1

Also, I suggest that throughput data should be based on sales data when available and, when sales data is not available (e.g., for produced water or for an individual separator / tank system not uniquely associated with sales data), should be consistent with sales data and with crude oil and produced water production data reported to DOGGR.

OP-21-2

95666 – Applicability

95666 uses the term “sectors” in the same manner the MRR and EPA’s Subpart W use the term “segments”. Using a different term to apparently mean the same thing, especially when neither term is defined, creates unnecessary uncertainty and confusion when interpreting the details of the regulation. I suggest replacing the word “sectors” with “segments” to achieve consistency with the MRR and with EPA’s Subpart W. (NOTE: The remainder of these comments will use “sector / segment” where I suggest the use of simply “segment”).

OP-21-3

I also suggest revising the sector / segment list in 95666(a) to (1) list offshore production as a separate sector / segment and (2) include the word “onshore” in the description of each of the remaining sectors / segments. Further, I suggest the “onshore crude oil or natural gas production” sector / segment be revised to “onshore crude oil or natural gas production equipment located on well pads”. These changes would provide a clearer distinction regarding what constitutes crude oil “production” equipment (sector / segment 1) and crude oil and produced water “separation and storage” equipment (sector / segment 2) and would achieve greater consistency with the MRR and with EPA’s Subpart W, thus reducing uncertainty and confusion in interpreting the regulation.

OP-21-4

Finally, there are numerous references throughout the proposed regulation to “facilities listed in section 95666”. However, the list in 95666 is a list of sectors / segments, not a list of facilities. Facilities are only generally described in 95666 as “facilities in the sectors listed below.....”. The term “facility” is then

OP-21-5

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

more specifically defined in section 95667. I suggest replacing all occurrences of the phrase “facilities listed in section 95666” with the phrase “facilities in the sectors / segments listed in 95666”.

OP-21-5
cont.

95667 – Definitions

(11) – “Component”.

The proposed definition is different from the definition of “component” in the MRR and in EPA’s Subpart W. Is there a specific reason for this? Unless the definition is intentionally different to serve a specific purpose, it creates unnecessary uncertainty and confusion when interpreting the regulation.

(18) – “Facility”

For onshore production facilities in particular, the definition of “facility” in this proposed regulation is not consistent with the definitions in either Subpart W or the MRR. This may cause uncertainty, confusion, and inconsistency in interpreting the regulation, in defining record keeping and reporting practices, and in agency and public use of the data collected under these regulations. Subpart W defines an “onshore production facility” as all equipment located on and “associated with” (specifically defined in the regulation) single well pads in a geologic basin and defines a “gathering and boosting facility” as all gathering and boosting systems / stations in a geologic basin. The MRR (in a guidance document) more broadly defines an “onshore production facility” to include all equipment in a geologic basin, including equipment on well pads and “associated with” (undefined in the regulation, but discussed in a guidance document) those well pads (not just with single well pads), including centralized separation and storage facilities, small gas processing plants, and centralized steam or electricity generation equipment serving those well pads, separation and storage facilities, and gas processing plants.

OP-21-6

An onshore oil and gas production facility already must conform to at least three different definitions of “facility”, depending on the air regulation at issue: (1) the traditional contiguous and adjacent property definition used by local air districts and in EPA’s NSR, NSPS and Title V regulations, (2) the basin-wide definition for the onshore production and the onshore gathering and boosting segments in EPA’s Subpart W regulation, and (3) the all-encompassing basin-wide definition (which is different from Subpart W and is the broadest of all) in the MRR. The definition in the proposed regulation is the traditional “contiguous and adjacent property” definition. However, as evidenced by the need for EPA’s recently issued “Source Determination for Certain Emission Units in the Oil and Natural Gas Sector” for use in the NSR, NSPS, and Title V programs, even that definition (specifically the term “adjacent”) has been interpreted differently by different agencies and even by the same agency in different geographic areas. This unnecessarily complex web of regulations with different definitions of “facility” for the same industry sector / segment causes inefficient and unclear communications within the regulated industry, between the industry and its regulators, and in communication with the public. Again,

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

this creates uncertainty, confusion, and inconsistency in interpreting the regulation, in defining record keeping and reporting practices, and in agency and public use of the data collected under these regulations.

My preference is for ARB to use the same definition of “facility” in this regulation as in the MRR. This would at least provide consistency between ARB’s various GHG regulations. However, if it is decided to retain the currently proposed definition of “facility”, I suggest that operators be allowed to define boundaries and submit reports for their facilities in accordance with the manner that local air districts have interpreted the term “adjacent” to define these “facilities”. This means that some facilities will be defined very broadly (though not basin-wide as in the MRR) and may include equipment that belongs to more than one sector / segment listed in 95666(a) and which may be located at several different physical addresses. For example, a facility that includes (1) onshore oil production (equipment located on well pads), (2) onshore crude oil and produced water separation and storage, and (3) an onshore natural gas processing plant may be one “facility” under the proposed definition. If each well pad, each separation and storage site, and each gas processing facility is considered a separate “facility”, the number of “facilities” will be significantly increased and the record keeping and reporting required by the regulation will be unnecessarily complex and burdensome.

OP-21-6
cont.

(30) – “Natural gas gathering and boosting station”

The phrase “associated with” in the proposed definition is not defined and, thus, the definition lacks clarity. For example, if a reciprocating compressor is located at either an “onshore crude oil production” site (i.e., a crude oil well pad) or at a “crude oil, condensate, and produced water separation and storage facility” and is used to “move” associated gas collected from well casings and/or from a tank vapor recovery system to a sales point or a gas processing plant via pipeline, is the compressor considered a, or part of a, “natural gas gathering and boosting station”? Based on the diagrams in Figures 6, 7, and 8 of the Staff Report, Table 4 of the Staff Report, and the Staff Report’s discussion of those items, I believe the answer is “no”. If ARB agrees, I suggest adding the following sentence to the definition of “Natural gas gathering and boosting station”:

“This does not include equipment and components located at crude oil production sites (well pads) or at crude oil and produced water separation and storage sites used to move associated gas to a processing plant or sales pipeline.” (It may also be appropriate for the regulation to include a definition of “associated gas”, e.g., the definition in the MRR.)

(47) – “Pressure vessel”

There is a typo in the first sentence, i.e., “means any a hollow container.....”.

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

Also, for clarity and for consistency with the definition of “tank”, I suggest revising the latter portion of the definition to read: “..... and designed to operate at 15 psig normal operating pressure or above without vapor loss to the atmosphere.”

(53) - “Separator”

I suggest revising the second sentence to say: “In crude oil production a separator may be referred to as a wash tank, a free water knockout (FWKO), a heater treater, or any other tank or pressure vessel used for the separation of crude oil from water.”

(60) – “Vapor control device”

I suggest adding the following phrase to the end of the proposed definition: “..... without serving any other useful process purpose”. As is, the proposed definition would appear to include combustion devices that destroy collected vapors while also performing a useful process purpose such as heating of process fluids or generating electricity. I don’t believe this is the intent.

(61) - “Vapor Control Efficiency”

Unless referring only to capture efficiency, vapor control efficiency is generally expressed as percent by weight, computed by dividing outlet mass emissions by inlet mass emissions. And it is generally expressed as a percent by weight of a specific compound or group of compounds. The proposed definition specifies “total hydrocarbon concentration at the inlet and outlet of the vapor control device”. Measuring only total hydrocarbon concentrations in inlet and outlet streams will generally not yield a true indication of vapor control efficiency on either a mass or volume basis.

Also, I suggest that all instances of the phrase “95% vapor control efficiency of total hydrocarbon emissions” in the regulation be revised to “95% control of total hydrocarbon emissions by volume” or “95% control of total hydrocarbon emissions by weight”, whichever is appropriate. Alternatively, since this is a regulation to control methane emissions, it may be more appropriate to replace the phrase “95% vapor control efficiency of total hydrocarbon emissions” with the phrase “95% control of methane emissions” (in which case it’s not necessary to specify whether the percent is by volume or by mass).

OP-21-6
cont.

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

95668 – Standards

(a) - Separator and Tank Systems

(a)(2)(A) – Clarification is needed regarding the throughput level thresholds of 50 BOPD and 200 BWPD. As discussed above in “General comments regarding throughput and flash emission calculations”, I suggest the thresholds be defined as average daily throughputs for an entire calendar year. I also suggest specifying that the first flash analysis testing must be performed by January 1, 2018, or during the calendar year following the calendar year in which the average daily throughput first exceeds either of the thresholds.

OP-21-7

(a)(2)(C) – I suggest revising this to read: “Separator and tank systems that do not contain crude oil, condensate, or produced water at the time field sampling is scheduled to occur. If a separator and tank system that is not sampled for this reason is later returned to operation, sampling and flash analysis shall occur within 90 days of initial production into the system.”

OP-21-8

(a)(2)(D) – I suggest revising this to read: “..... from any newly completed (i.e., drilled and cased) well for up to 90 calendar days.....”. Once a well has been drilled and cased, completion and testing of the well is sometimes deferred for a period of time for logistical, economical, or other reasons. The need for flash analysis testing should not dictate when a newly drilled well must be completed to establish initial production.

OP-21-9

(a)(4) – Instead of “Beginning January 1, 2018, owners or operators of new separator and tank systems that are not controlled.....”, I suggest: “Owners or operators of separator and tank systems which first receive production on or after January 1, 2018, that are not controlled.....”

OP-21-10

(a)(6) and (a)(7) – A new or modified vapor collection system requires an air permit, construction of the system cannot commence until a permit is issued, and it is not possible to obtain a variance from the requirement to obtain a permit. In consideration of this, I suggest the compliance date should be the date by which an operator must submit a permit application to the local district or other permitting authority. Once an operator determines (based on flash analysis) that an uncontrolled system requires vapor control, several months will generally be required to design, permit, and install such a system. In some Districts, it can take a year or more for the District to process a permit application and issue a permit. If CEQA review is triggered (which has become a more common occurrence), it often takes even longer. In absence of a permit, an operator would need to curtail production to a level that results in emissions less than 10 MT CH₄ per year from the subject separator / tank system in order to avoid operating out of compliance (see suggestion below regarding an operator option to limit throughput). This curtailed level of production may not be economical and, thus, could significantly impair the operator’s return on investment or even require the operator to completely shut in the separator / tank system and its associated oil and gas production. I suggest an operator only be required to submit an application for a permit within 90 days of the date of the flash analysis that indicates a need for a vapor

OP-21-11

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

recovery system and that a reasonable time frame of, say, 180 days, be allowed to procure, install, and commission equipment once a permit is issued (with provisions for extension if permit issuance is delayed by the permitting authority). This would relieve the operator from potential liability of operating out of compliance because of delays caused by the permitting agency’s timeline to process and issue a permit which are beyond the operator’s reasonable control.

OP-21-11
cont.

Finally, if the above recommendation to use the average daily throughput for the previous calendar year as the basis for flash emission calculations is accepted, an operator should have the opportunity to limit throughput for a separator / tank system to ensure annual emissions are less than the 10 MT CH₄ per year threshold. I suggest the same timeline as above would apply, i.e., within 90 days of the date of the flash analysis that exceeded 10 MT CH₄ per year, the operator must submit an application to modify the permit to limit the throughput. [If the throughput limit is greater than either 50 BOPD or 200 BWPD, the affected separator / tank system would continue to be subject to 95668(a)(8), requiring continued flash analysis testing as applicable).]

OP-21-12

(a)(8)(A) – See general comments above regarding throughput and flash emission calculations.

OP-21-13

(b) - Circulation Tanks Used for Well Stimulation Treatments

(b)(1) – Regarding the requirement for a “best management practices plan to limit methane emissions from circulation tanks”, the rule specifies that owners or operators “shall provide that plan to ARB” (by January 1, 2018), but does not specify that ARB may approve or disapprove the plan. However, the Staff Report, on page 39, says “Additionally, ARB’s Executive Officer may approve or disapprove the plan, in whole or in part.” I assume the Staff Report is incorrect and that ARB approval of a plan will not be required for an owner or operator to proceed with a well stimulation treatment that involves the use of a circulation tank. If ARB intends for plan approval to be required, it should be specified in the rule. And then, to avoid the potential for unnecessary and costly delays in performing needed well stimulation treatments, owners / operators will need to know with certainty the timeframe required for ARB’s review and approval or disapproval of both an originally submitted plan as well as any amended plan that may be needed to secure ARB approval.

OP-21-14

Also, many smaller operators rarely perform “well stimulation treatments” as defined in the rule, especially now during a time of relatively low crude oil prices. But these operators will need to either develop and submit a “just in case” plan by January 1, 2018, or accept the risk that they won’t be able to perform a “well stimulation treatment” if the need arises after that date. If they choose to develop and submit a “just in case” plan, there’s a good chance their time and effort will be wasted. To address this concern, I suggest including a maximum number of well stimulation treatments that could be performed by any one operator in any one calendar year that would not trigger the requirement for a best practices management plan. I suggest this threshold be five “well stimulation treatments” (as defined in the regulation) in any one calendar year.

OP-21-15

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

(b)(2) – Regarding the requirement to submit a written report of circulation tank usage and emission control effectiveness by January 1, 2019, I suggest the deadline be revised to June 1, 2019. This will enable operators to include the results of all calendar year 2018 activity in their reports, which will result in a more robust set of data for analysis.

OP-21-16

(b)(3) - To require vapor control with 95% efficiency on all circulation tanks by January 1, 2020, suggests that ARB has already concluded that such control is technically and economically feasible. If this is the case, there is no reason to delay this requirement to 2020 or to require operators to prepare and submit a best management practices plan or to prepare and submit written reports of their experience with various control techniques. I suggest this requirement be deleted from the current regulation and then reconsidered once the written reports required by (b)(2) have been submitted and evaluated. Then, the regulation can be amended as warranted based on actual data.

OP-21-17

(c) - Vapor Collection Systems and Vapor Control Devices

(c)(2) – I suggest that collected vapors be allowed to be directed to either existing, new, or modified sales gas, fuel gas, or gas disposal systems as long as compliance with all applicable federal, state, and local requirements is achieved.

OP-21-18

(c)(3) – Consistent with the suggested change to (c)(2) above, I suggest that any collected vapors not able to be directed to an existing, new, or modified sales gas, fuel gas, or gas disposal system be directed to a vapor control device - either existing, new, or modified - that meets the requirements of (c)(4).

OP-21-19

c)(6) – It should be clarified that vapor control system downtime does not count toward the 30 calendar days allowed if the equipment served by the vapor control system is not operating (i.e., has zero throughput).

OP-21-20

(d) – Reciprocating Natural Gas Compressors

(d)(2)(A) – It appears the word “powered” is a typo and should be deleted.

OP-21-21

(d)(3) – I suggest adding “crude oil, condensate, and produced water separation and storage facilities” [corresponding to 95666(a)(2)] to the types of facilities subject to these requirements. Based on explanatory material in the Staff Report (especially Table 4: Control Mechanisms by Category) and the lack of inclusion of “crude oil, condensate, and produced water separation and storage facilities” in (d)(4), I believe this is consistent with ARB’s intent.

OP-21-22

(d)(4) – I suggest that reciprocating compressors with a maximum rating of 50 bhp or less or that have an annual throughput less than 2 mmscf per year be exempt from the requirement to measure emission flow rate from rod packing or seal vents. A compressor operating with a throughput of 3.8 scfm (equivalent to 2 mmscf per year of continuous, constant rate operation) would need to leak nearly 50% of its throughput to exceed the 2 scfm leak threshold that triggers corrective action.

OP-21-23

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

95669 – Leak Detection and Repair

(b)(1) – This section states that the LDAR requirements of this rule are not applicable to:

“Components, including components found on tanks, separators, and pressure vessels that are subject to local air district leak detection and repair requirements prior to January 1, 2018.”

The issue here is semantics, i.e., what is meant by the phrase “subject to”, and ensuring the rule language is consistent with our understanding of ARB’s intent. I believe ARB’s intent is to ensure that all components not already being inspected and repaired per a local LDAR program be “subject to” the requirements of Section 95669 while also avoiding the creation of unnecessarily redundant, overlapping, and burdensome record keeping and reporting requirements. Where local LDAR programs are already in place, but contain exemption provisions for certain components, some operators have chosen to voluntarily comply with the full requirements of the local program for all components, including components for which the local program provides an exemption (e.g., < 10 % VOC service). The question then becomes: Are the components that are eligible for exemption but not actually being exempted from the local program considered “subject to” the local program and, therefore, exempt from Section 95669? I believe the answer should be “yes”, as long as the operator continues to not claim the exemptions available under the local program. To address this more clearly, I suggest that 95669(b)(1) be amended to read as follows:

“Components, including components found on tanks, separators, and pressure vessels, where a local air district leak detection and repair program was in place prior to January 1, 2018, and the requirements of such program will be complied with after January 1, 2018, including components otherwise eligible for exemption from the local program.

This will allow operators to avoid unnecessarily redundant and overlapping record keeping and reporting requirements (i.e., reporting similar, but different data to two different agencies) by choosing to comply with the local program even for components that would otherwise be exempt from the local program (e.g., components in <10% VOC service). If this recommendation is not accepted, operators with this situation will be subjected to considerable redundant, overlapping, and confusing record keeping and reporting requirements, complicated by different definitions of “component”, different leak thresholds, different exemptions, etc. In addition, if our suggestion above regarding how to interpret “facility” is not accepted, there will also be differences in the “facilities” for which data must be reported, requiring different sorts of basic data to fulfill reporting requirements for two different programs. Managing an LDAR program for thousands, tens of thousands, or even hundreds of thousands of components is already a significant effort. Complicating it with overlapping, redundant, and inconsistent requirements and definitions in another regulation will make program management unnecessarily burdensome.

OP-21-24

OP-21-25

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

(b)(6) – If components are in compressed air service, the composition of the component should not be a factor. I suggest the unnecessary term “stainless steel” be deleted from this exemption.

OP-21-26

(b)(7) – The MRR and Subpart W exempt “tubing systems equal to or less than one-half inch diameter” from consideration when quantifying and reporting emissions under those regulations. The exemption in 95669(b)(7) inserts the qualifier “stainless steel” in this exemption. I suggest deleting the qualifier “stainless steel”. Narrowing this exemption from the one provided in the MRR and in Subpart W will cause operator confusion in record keeping and reporting and, thus, create potential for unintentional non-compliance. It will also likely cause confusion and errors when agencies attempt to interpret, use, and compare data reported in accordance with the different regulations.

OP-21-27

(f) - The requirement to quantify a leak within 24 hours is overly burdensome for many locations and will often involve additional vehicle trips and expense for overtime work. I suggest an allowable leak quantification period of 72 hours to ensure efficient use of resources, eliminate unwarranted vehicle trips (and the associated emissions) and avoid unnecessary overtime expense.

OP-21-28

(o) – Compliance with Leak Detection and Repair Requirements. This subsection specifies that exceedances of the allowable number of allowable leaks or the 50,000 ppmv leak standard “during any inspection period as determined by the ARB Executive Officer or by the facility owner or operator” “shall constitute a violation this subarticle”. To consider an owner or operator to be in violation when the results of a self-inspection indicate an exceedance of a standard is excessive and unnecessary. The goal of an LDAR program should be to ensure that operators actively identify and repair leaking components. Operators should be encouraged and recognized for efficiently performing self-inspections and promptly repairing leaking components without being subjected to enforcement for doing so. South Coast AQMD recognized this when they implemented their LDAR rule – Rule 1173. Rule 1173(d) specifies that operators will be in violation of the rule only if exceedances of defined leak standards are detected during a District inspection. I suggest the phrase “or by the facility owner or operator” in subsections (o)(2), (o)(3), and (o)(4) be deleted.

OP-21-29

95670 – Critical Components

(b) – The phrase “and that shutting down the critical component would result in emissions greater than the emissions measured from the component” is not reasonable. Shutting down a critical process unit will generally not cause additional emissions, but will generally cause production to be curtailed, which results in loss of revenue. So, the criteria for a critical component should be (in addition to an impact to safety or reliability of the system) a threshold for the amount of revenue that would be lost if the critical component / process unit must be shut down to effect repairs. The threshold should be approximately equivalent to the cost-effectiveness of the LDAR requirements in the proposed rule (i.e., \$15 of lost revenue per MT CO₂e to be reduced?).

OP-21-30

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

95672 – Reporting Requirements

See comments below for “Appendix A” and “Appendix C”.

95673 – Implementation

(b)(1)(A) – This section states: “This requirement applies to facilities or equipment upon issuance of any new local air district permit covering these facilities or equipment, or upon the scheduled renewal of an existing permit covering these facilities or equipment.”

OP-21-31

Will operators be required to submit applications to have local air districts modify existing permits prior to scheduled (e.g., annual) permit renewals? If yes, this imposes significant fees (approximately \$1,500 to \$7,000 per permit in South Coast AQMD) that do not appear to have been considered in determining the cost impacts of this regulation.

OP-21-32

Whether operators are required to submit applications or not, there will likely be instances where local air districts are unable to issue updated permits within the required timeframe. In such cases, operators need assurance they will not be in violation if the local air districts fail to issue updated permits in the required timeframe.

OP-21-33

(b)(2)(A)(3)(c) – Please refer to our general comments regarding throughputs and flash emission calculations.

OP-21-34

(b)(2)(B) – If changes occur late in the year, it may not be practical to report such changes by “January 1 of the calendar year after the year in which any information required by this subarticle has changed”. A more reasonable reporting deadline would be March 1, instead of January 1, of the calendar year after the year in which any information required by this subarticle has changed.

OP-21-35

Appendix A – Record Keeping and Reporting Forms

General – Applicable to multiple reporting forms

Facility Name – Please refer to the comments regarding “Applicability” and the definition of “facility” above.

OP-21-36

Throughput - Please refer to the “General comments regarding throughput and flash emission calculations” above.

Table A1 – Flash Testing Record Keeping and Reporting Form

Days in Operation per Year – Consistent with the comments on throughput values, I suggest this should be the number of days in the year during the prior calendar year.

OP-21-37

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

Pressure Vessels – Is this field intended to be only pressure vessels that are used as separators in separator / tank systems? Or should it also include other pressure vessels such as small liquid knock-out vessels / scrubbers associated with gas compressors?

Separators – Should this field include pressure vessels used as separators? Should it include sumps that are used as separators?

Sumps – Should this field include sumps that are also counted as separators?

OP-21-37
cont.

Table A4 – Leak Detection and Repair Inspection Record Keeping and Reporting Form

Inspection Date – Note that larger facilities require more than one day to complete an inspection and the inspection days may not always be consecutive. So expect to see multiple dates and / or date ranges entered in this field.

OP-21-38

Table A5 – Component Leak Concentration and Repair Record Keeping and Reporting Form

Inspection Date – Same comment as above for Table A4.

Instrument Calibration Date – For larger facilities, expect to see multiple dates entered in this field as inspections may occur over a period of several days, which are not always consecutive.

OP-21-39

Table A6 – Reporting and Registration Form for Facilities

Number of Wells – I suggest this should be the number of active producing wells (i.e., excluding injection wells and inactive production wells) at the end of the prior calendar year (similar to our comments regarding “throughput”). Similar to throughput values, the number of wells changes frequently. Also, note that the number of crude oil wells and the number of produced water wells will usually be the same number (unless the facility has water source wells that are “produced water wells”).

OP-21-40

Appendix C – Flash Test Procedure

General - ARB staff have stated that the flash analysis testing procedure prescribed in this regulation is “the same, but modified” as compared to the flash test procedure prescribed in the MRR. I do not understand how the procedure can be both “the same” and “modified”. To avoid unnecessary redundancy and expense, I believe the flash analysis testing required to comply with both regulations should be identical and the required record keeping forms for flash analysis testing should be the same for both regulations. Alternatively, the proposed regulation should state that the prescribed flash test procedure is acceptable for use in calculating and reporting emissions per the MRR.

OP-21-41

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

Section 5.5 – The term “steady state” is used to describe the temperature and pressure of the separator and tank system being sampled. The term “steady state” is not defined within the procedure itself nor in the proposed regulation. The Merriam-Webster online dictionary defines “steady state” as:

“a state or condition of a system or process (as one of the energy states of an atom) that does not change in time; *broadly* : a condition that changes only negligibly over a specified time”

Field production systems, including separator and tank systems and especially systems using a temporary portable pressurized separator for flash analysis sampling, rarely, if ever, operate at “steady state” conditions. So it is not practical to require such a condition for flash analysis sampling. I request that ARB either (a) delete the term “steady state” or replace it with a more reasonable term, e.g., “at temperature and pressure conditions that are varying as little as practical”.

Staff Report

Executive Summary and page 2 of the Staff Report

In the third paragraph on the first page of the Executive Summary, it is stated: “Oil and gas systems are responsible for approximately 15 percent of methane emissions in the state.” But in the last paragraph on page 2 of the main section of the Staff Report (Section I-A-2), it is stated: “Oil and gas systems contribute approximately 13 percent of statewide methane emissions”. The two statements appear to be in conflict.

Page 23:

The first sentence under “(e) – Natural Gas Processing Plants” states:

“Natural gas processing plants process raw natural gas and separate the various hydrocarbons and fluids from the raw natural gas, to produce what is known as “pipeline quality” dry natural gas.”

Please note that not all natural gas processing plants produce “pipeline quality” gas. Some produce gas that does not qualify as “pipeline quality”, yet is suitable for use as fuel, for re-injection in the subsurface, etc.

Page 27:

The second sentence of the third paragraph on this page states:

“In addition, the proposed regulation establishes an emissions standard for non-field compressors, which, if exceeded, in addition to any applicable penalties, require the compressor be repaired, replaced, or the gas must be collected and routed into the vapor collection system.”

**Comments on 5-31-2016 version of proposed:
“GHG Emission Standards for Crude Oil and Natural Gas Facilities”
(CCR, Title 17, Div. 3, Ch. 1, Subchapter 10 - Climate Change, Article 4, Subarticle 13)**

The term “non-field” in this sentence is undefined and unclear.

Also, I suggest the sentence be replaced with the following two sentences:

“In addition, the proposed regulation establishes an emissions standard for compressors at certain facilities, which, if exceeded, in addition to any applicable penalties, require the compressor be repaired, replaced, or the gas must be collected and routed into the vapor collection system. The affected facilities are those in the following sectors / segments: natural gas underground storage, natural gas gathering and boosting stations, natural gas processing plants, and natural gas transmission compressor stations.”

OP-21-46
cont.

Page 29:

Footnote 40 to Table 5 includes the sentences:

“Also includes remaining emissions from sources controlled by districts. For example, tank measures are 95% effective so there are 5% of the original emissions remaining.”

It is unclear what this footnote means.

OP-21-47

Page 34:

The summary of Section 95668(a)(2)(E) includes the phrase “for up to 90 calendar days following completion”. I believe that inclusion of the words “following completion” is in error and should be deleted. [Section 95668(a)(2)(E) of the rule does not include the words “following completion”.]

OP-21-48

Page 48:

The heading for this section (“Centrifugal Natural Gas”) should be “Centrifugal Natural Gas Compressors”.

OP-21-49

Page 57:

The first sentence in the “Rationale of Section 95669(b)(7)” says “..... that have been previously testing.” I believe it should say “..... that have been previously tested”.

OP-21-50